THE IRON TRADE REVIEW

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MOST FAVORABLE

ARE THE REPORTS FROM ALL PARTS OF THE UNITED STATES.

Unprecedented Demand for Rails Continues—Pig Iron Production Has Increased—Wire Prices Advanced.

Reports from all parts of the country this week are highly favorable concerning conditions in almost every branch of the iron and steel industry. Interviews with prominent manufacturers in regard to the effect of peace terms being agreed upon by Russia and Japan, especially in the light of the gracious act of the Czar in removing the discriminating duties from American products, are unanimous in the expression that American interests, particularly the manufacturers of machinery, will be much benefited. In some interviews the prediction is made that the development of the far East will far exceed anything that has been imagined.

Tremendous Rail Sales.

The buying of steel rails has been continued at an unprecendented rate. The mills have now booked directly for 1906 delivery fully 1,300,000 tons of rails, and at least 200,000 tons, ordered for this year, will have to be carried over, making the immense grand total of 1,500,000 tons already on the books for next year. Owing to the fact that it was impossible to roll in Chicago all the rails ordered by western roads, it became necessary some time ago, to transfer orders for 100,000 tons from Chicago to Pittsburg. This action required western roads to pay $2.00 per ton more on account of the added freight. Profiting by their experience this year, western and southern roads are placing their early orders for 1906 much more heavily than the eastern roads. The Chicago mill has booked orders for more than 500,000 tons for 1906.

Large Increase in Production.

The early estimate of 2,000,000 tons of rails to be made in the United States during 1905 was based upon the rate at which rails were being bought by the trunk lines early in the year. It is now apparent that the production of all kinds of rails in 1905 will exceed 2,500,000 tons, and that the production for 1906 will be at least 3,500,000 tons. The majority of rail mills are able to furnish rails or sheet bars by simply changing the rolls, and in the average year such mills produce large quantities of billets and sheet bar products. In the second half of this year, however, all such capacity is being kept exclusively on rails.

Bridge Company Very Busy.

The demand for plates and shapes continues with steadily increasing volume. A large tonnage of plates has been booked in the past week for lake vessels, and plates for the many steel cars recently booked have been ordered. Additional steel car orders will doubtless be placed at an early date. The demand for structural steel is much stronger. The American Bridge Co. reports its estimating department was never so busy as at the present time. Reports of building operations show an increase of 48 percent over last year.

Blast Furnace Production.

Our blast furnace statistics for August indicate a production of 1,822,971 tons, as compared with 1,719,728 tons in July. Stocks on hand remain about the same. Candor compels the statement that owing to the decision reached by interests representing some fifty furnaces that it is not wise to publish monthly reports of production and stocks, it has been impossible to make the report for last month as accurate as heretofore. As to whether these statistics are to be published in the future depends upon the wishes of the producing interests.

Pig Iron Is Stronger.

The pig iron market this week shows increased strength, with tendency toward advancing prices. Heavy purchases of Bessemer pig iron by the United States Steel Corporation and another large interest are expected within a week. In the East, particularly, the demand for steel making iron dominates the market. The number of furnaces which will not sell foundry iron below $15.00, valley, is increasing, and in the South there is a growing tendency to hold for $12.00. There is a scarcity of foundry iron in the Chicago district, and shipments are being made from Cleveland and other manufacturing centers. A considerable tonnage of malleable iron has been sold, and inquiries for large tonnage of basic are pending. Cast iron interests have purchased rather liberally within a few days.

Billets are Very Scarce.

The scarcity of billets and sheet bars is an interesting feature of the market. Since the withdrawal of the Carnegie Steel Co. as a seller of this crude steel, there has been no regular supply, and the difficulty of buyers in placing orders has become more acute. Within a few days, inquiries for 20,000 tons of billets have been rejected by one interest. Many consumers of sheet bars are fortunate in having contracts at the present time.

Finished Materials.

Manufacturers of shafting had a meeting at Chicago a few days ago, in an effort to check the growing irregularity of prices. The prices were re-affirmed. The sheet market is somewhat improved, although concessions are still being made. The price of wire products has been advanced $1.00 per ton. An advance in plates will soon be made, and probably a higher quotation on merchant steel bars will be announced later. The Carnegie Steel Co. is now operating practically its entire steel-making and finishing capacity, and with the resumption of the one Zanesville and two Columbus furnaces it will have all of its 51 furnaces in operation with the exception of one or two of small capacity, and two or three undergoing repairs.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Whole Market in Fine Condition—Wire Products Advanced $1 per Ton.

OFFICE OF *The Iron Trade Review*,
521 PARK BUILDING, September 13.

Effective Tuesday of this week all wire products have been advanced $1.00 per ton. The advance has been predicted for some time and was made without the formality of a meeting, as was the case also with the recent advance in shapes.

Buying of rails by western roads has been particularly heavy, but eastern roads have also done well, and the total tonnage on books for 1906 delivery, including hold-overs, is more than 1,500,000 tons, or more than half the record production in any one year.

About 30,000 tons of plates and shapes have been placed with local mills in the past week, for lake vessel construction in the early months of 1906. No plate or shape tonnage is as yet being sold on open contracts for next year, the only business accepted being for definite undertakings.

A firmer tone prevails in the sheet market, extreme concessions being withdrawn. A definite advance in the sheet market is likely to follow the advance in sheet bar prices. In tin plates demand is a trifle heavier. The largest independent tin mill, that of the Pope Tin Plate Co., at Steubenville, resumed operations this week, having been idle since the beginning of July. All the independent tin mills of any consequence are now in operation. The leading interest is this week operating very nearly one-half its tin mills, and will start the bulk of the idle ones by Monday, Oct. 2.

An advance in plates is likely to be made in a short time and later, but before the end of the year, an advance in merchant steel bars. Common iron bars have advanced in the open market about $2.00 per ton in the past fortnight.

It can be stated that outside of the small Columbus steel plant, and two or three trains of rolls which are idle for repairs, the Carnegie Steel Co. is operating its entire steelmaking and finishing capacity, while, with the resumption of Zanesville and the two Columbus stacks, now scheduled, it will have all its 51 blast furnaces in operation except one or two unimportant detached stacks, and two or three furnaces which are undergoing necessary repairs.

The whole iron and steel market is in as strong a condition as can be imagined, with the brightest prospects for the balance of this year and for at least the first half of next year.

Pig Iron.—Sales of Bessemer pig have been very light during the week, but the market is very firm at a minimum of $15.00, valley, at which we note sales of some moderate-sized lots, while $15.25 was obtained on one lot of 100 tons. The Cambria Steel Co. is likely to be in the market within a week for a round lot of Bessemer and basic. The United States Steel Corporation will not buy any additional Bessemer iron for this month, but in about a week will take up the question of Bessember for October, and may take 30,000 to 40,000 tons. In basic we note a sale of 5,000 tons at $15.00 valley, the strong price for such a round tonnage being due to the fact that deliveries begin at once and are to be completed in October. Most producers hold to this figure, but on a round tonnage for easy deliveries some sellers would do $14.90, valley. Sales of foundry iron in the local market have not been heavy, but this week has seen a very large enquiry, and some large business is likely to be done in the next two weeks. Sales in other consuming districts tributary to the Central West have been very heavy, putting up furnace prices flatly to $14.50, valley, for No. 2, or $15.35, Pittsburg. Gray forge is firmer, sales having been made in this district lately of round tonnages at $14.50, $14.65 and $14.75, delivered. Other districts have taken good tonnages and the recent plethora of this grade is taken up, the market being firm at $14.65 to $14.75, delivered Pittsburg. We quote:

Bessemer, Valley	$15.00 to $15.25
Bessemer, Pittsburg	15.85 to 16.10
No. 1 Foundry, Pittsburg	15.85 to 16.35
No. 2 Foundry, Pittsburg	15.35 to 15.85
Gray Forge, Pittsburg	14.65 to 14.75
Basic, Valley	14.90 to 15.00
Basic, Pittsburg	15.75 to 15.85

Steel.—Since the withdrawal of the Carnegie Steel Co. as a seller of billets and sheet bars, there has been no regular source of supply and only odd lots can be picked up here and there, partly from middlemen and partly from various mills, which may take on a small tonnage to oblige customers. There is no large tonnage available at any price. Since the beginning of last week enquiries for more than 20,000 tons of billets have been turned down by one interest, and this enquiry has not been satisfied in any quarter. There has been little enquiry for sheet bars, as consumers who have not their own special source of supply are quite generally covered by contracts with the leading interest, which give them their tonnages on prices fixed month by month, the consumer not being obligated to take the steel if he can find it elsewhere at a lower price. On such contracts maximum tonnages are being taken right along. The adjustment price for October sheet bars on these contracts will likely be fixed at $26.00, Pittsburg, against $25.00, which covered August tonnages, cut bars being 50 cents extra. Small billets are not obtainable in any tonnage at any price in the domestic market. Small billets can be imported and laid down at about $29.00, on dock, Baltimore, deliveries being promised in four to five weeks. If consumers must have small billets there does not seem to be any other source of supply, and the question hinges upon whether they can afford to pay the price, in view of contracts they may have on their finished material. Some steel producers continue in the position that they would themselves buy round tonnages of steel if a satisfactory price could be made. Whether the market will advance further will depend upon how insistent the demand proves to be. On the present outlook most customers are well covered, except for forging and some special billets. We quote the market largely nominal at $25.00 for Bessemer billets, $26.00 to $27.00 for forging billets, $26.00 for sheet bars, long lengths, and $26.50 for short lengths, all f. o. b. Pittsburg.

Ferro-Manganese.—The market continues very firm, with an advancing tendency. Importers of ore and ferro are endeavoring to create another scare as regards future deliveries, but conditions appear to be able to take care of themselves. We note sales of fairly large sized lots at $50.00, small lots going at $51.00 to $51.50.

Muck Bar.—The market is very quiet, no new sales being reported this week, and we continue to quote the market nominally $26.20, Youngstown, or $27.15, delivered Pittsburg.

Skelp.—There have been some fair sized sales of skelp and the market is firmer in tone than for some time. We quote prices as follows: Bessemer steel, grooved, 1.50c; sheared, 1.55c; iron, grooved, 1.55c; sheared, 1.60c to 1.65c.

Rails and Track Material.—To date the local rail interest has booked over 100,000 tons of rails for 1906 shipment. The Western and Southern roads have bought much more heavily than the Eastern roads, being prompted by the fact that this year they are losing money by having to take Pittsburg instead of Chicago rails. When, some time ago,

the Chicago mill became filled for this year, some belated tonnage had to be placed at Pittsburg, and necessarily at the price of $28, Pittsburg, instead of $28, Chicago, the added freight averaging about $2.00 per ton. The total amount of such Pittsburg rail business for Western roads will probably aggregate 100,000 tons this year. The Western roads are accordingly placing their orders early, and have about filled up Colorado for the entire year, Alabama for the greater part of the year, and the Chicago interest through September, the Chicago mill having booked between 500,000 and 600,000 tons for 1906, and being certain to carry over about 100,000 tons. Altogether, it is a conservative estimate that there have been booked directly for 1906 delivery fully 1,300,000 tons of rails, and that 200,000 tons or more will have to be carried over, making a grand total of more than 1,500,000 tons on books for next year, with the Pennsylvania and some other tonnages likely to be placed before this week is over, and other tonnages to follow. The recently advanced prices of light rails are being obtained without difficulty. We quote:

Fifty pounds and heavier, 500-ton lots and over, $28; carload lots and less than 500 tons, $30; less than carload lots, $32; light rails, 16-lb., $29 to $30; 20-lb., $27.50 to $28; 25 to 45-lb., $26; angle bars for standard sections, 1.35c; spikes, 1.75c.

Plates.—A large tonnage of plates has been booked in the past week for lake vessels to be constructed in the early part of next year. Plates for the steel car orders recently booked have all been placed. Some additional steel car orders are likely to be placed in the near future, but the heaviest of the buying movement in this line is probably over for the present, large additional orders being expected early in the new year. The local mills can make scarcely any deliveries of plates this year. Contracts for next year are being made only for plates entering into definite operations, but later contracts will be made for running tonnages. Light plates and heavy gauge sheets are relatively not very firm, concessions from regular prices sometimes amounting to as much as $2.00 a ton on some gauges lighter than No. 8. There is not much demand for early delivery of sheared plates, but such business generally has to go to the Eastern mills. We quote:

Tank plates, ¼ in. thick, 6¼ in. to 14, inclusive, 1.50c f. o. b. mill Pittsburg; over 14 in. up to 100 in., 1.60c. Extras are as follows per 100 lb.: Flange and boiler steel, 10c; marine, A. B. M. A., and ordinary fire box, 20c; still bottom, 30c; locomotive fire box, 50c; plates over 100 in. up to 110 in. in width, not less than 5c extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick, 10c extra; gauges 7 and 8, 15c extra; No. 9, 25c extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except Pacific Coast.

Merchant Bars.—The iron bar market is now well established at a minimum of 1.65c, Youngstown, or 1.70c, Pittsburg, while the leading producer's price is 1.70c, Youngstown, and some tonnage is being booked at this figure. Buying has been fairly good and the market is regarded as very satisfactory, with an extreme advance of $3.00 per ton in the past month or six weeks and $2.00 a ton in the past fortnight. Specifications on steel bars are fully up to the current output of the mills, which are filled with specifications for a couple of months or more ahead. Deliveries are hard to get, but in general no real hardship has been experienced through inability to get material. An advance in steel bars is very likely to be made before the close of the year. We quote:

Bar iron, 1.65c to 1.70c, Youngstown; hoops, 1.65c and bands 1.50c; both taking hoops and bands extra, respectively. Bessemer steel bars, 1.50c; open-hearth steel bars, 1.50c; plow and cultivator, 1.50c, net; channels, angles, zees and tees, under 3 in., 1.60c. The following differentials are maintained on steel: Less than 2,000 lb., 10 cents advance; less than 1,000 lb. of a size, 30 cents advance.

Structural Material.—Some shape contracts are being made against vessel construction and structural work booked for next year, but in general there is not much activity, the mills being absolutely sold up for this year and destined to carry a considerable tonnage over into next year. Fancy prices are easily obtained on small lots of shapes from stocks, which are extremely light, and practically exhausted as regards some sizes. We quote:

Beams and channels up to 15 in., 1.70c; over 15 in., 1.80c; zees, 1.70c; tees, 1.75c; angles, from 3 to 8 in. inclusive, 1.70c; universal and sheared plates 6¼ to 14 in., inclusive, 1.50c; over 14 in., 1.60c, base.

Sheets.—The market is firmer in that extreme concessions have been withdrawn, even on the most desirable tonnages. On ordinary lots prices have not advanced, and it is possible with some producers to do 2.25c on black and 3.30c on galvanized, No. 28, if the specifications are desirable. In some cases such producers would not name any lower price on large tonnages. Sheet mills which have adjustment contracts for bars will have to pay a dollar advance for their steel next month, and this can hardly but be reflected in the sheet market, as it is obvious that prices for some time past have been down to rock bottom. Tonnage is improved somewhat, and is really quite satisfactory, the leading interest and the independents operating to nearly full capacity. Corrugated roofing remains at $1.65 to $1.75 per square for painted and $2.85 to $2.95 for galvanized, No. 28 gauge, in carload lots. We quote nominal prices on sheets as follows:

No. 30, 2.65c; No. 29, 2.55c; No. 28, 2.40c; No. 27, 2.30c; Nos. 25-26, 2.25c; Nos. 22-24, 2.20c; Nos. 17-21, 2.15c; Nos. 15-16, 2.10c; Nos. 13-14, 2.05c; Nos. 10-12, 2c. Galvanized, Nos. 10-11, 2.35c; Nos. 12-14, 2.45c; Nos. 15-16, 2.55c; Nos. 17-21, 2.70c; Nos. 22-24, 2.85c; Nos. 25-26, 3.05c; No. 27, 3.25c; No. 28, 3.45c; No. 29, 3.70c; No. 30, 3.95c. Quotations f. o. b. Pittsburg, 30 days net, 2 percent off cash 10 days.

Wire and Wire Nails.—Effective Tuesday, Sept. 12, all wire products were advanced 5 cents a hundred pounds or $1.00 per net ton. A meeting was to have been held in Chicago this week to discuss the matter, but the trade situation developed such strength that the advance could be arranged without any meeting, all interests concurring, as was the case with the important structural shape advance week before last. Tonnage has been improving steadily in wire products and is now about up to the capacity of the mills, which are operating substantially full, but are, in accordance with a definite determination, accumulating no stocks whatever. We now quote prices as follows:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90, and less than carloads, $2.00; painted barb wire, $2.00 for jobbers in carloads; retailers' carloads $2.05, and less than carloads, $2.15, with 30c for galvanizing. Annealed smooth fence wire is held at $1.70, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in 10 days. Iron and steel cut nails, $1.70 to $1.75.

Merchant Steel.—There is no change to report in this

market, demand being fully up to normal. We quote:

Cold rolled and ground shafting, 50 percent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.0c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.70c to 1.75c; toe calk, 2c to 2.05c.

Pipes and Tubes.—Demand for merchant pipe is fairly good. Some independent mills are so well filled that they have advanced their prices, but others are quoting former prices, which are about four points or $8.00 per ton below the nominal or so-called official discounts of the leading interest.

	Steel		Iron	
Carloads	Black	Galv.	Black	Galv.
⅛ and ¼ inch	68½	52½	68½	50½
⅜ and ½ inch	72½	60½	70½	58½
¾ to 6 inches	76½	66½	75	65
7 to 12 inches	71½	56½	70	54½
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	60	48	58	46
½ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong plain ends, ⅛ to 8 inches	56	45	54	43

MERCHANT BOILER TUBES, CARLOADS, 22 FEET AND UNDER.

	Steel	Iron
1 to 1½ inches	44	41
1¾ to 2¼ inches	56	41
2½ inches	58	46
2¾ to 5 inches	64	53
6 to 13 inches	56	41

Less than carloads, two points less.

Old Material.—The market has stiffened further in tone, dealers being confident that there will be a good market for any material they accumulate now, and they continue to bid excellent prices for old material, usually higher than would afford them a profit if the material were forced to sale at present. There has been a somewhat better demand from rolling mills for busheling and other grades of scrap, at slightly better prices. A much better demand is expected in the near future. We quote:

Heavy melting stock, $15.50 to $16.00; low phosphorus material, $18.50 to $19.00; rerolling rails, $16.00; cast scrap, $14.75 to $15.25; borings, $9.50 to $10.00; No. 1 wrought, $17.00 to $17.50.

Coke.—The market continues strong, but without heavy transactions. Production and shipments continue very large. We quote strictly Connellsville furnace coke at $1.85 to $1.95 for prompt or contract, and 72-hour standard Connellsville foundry coke at $2.45 to $2.60, f. o. b. ovens.

CHICAGO.

Western Railroads Buying Heavily—Shafting Manufacturers Meet.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, September 13.

The demand for rails continues in unprecedented volume. The tonnage placed with the local mill last week runs into six figures, and there is remaining unsold but a small percentage of its total output for next year. Kindred products, such as angle bars, spikes, track bolts, light rails, etc., have shared in the heavy rail movement, Western mills having booked large orders for each of these materials within the past week. Billets are exceptionally strong and very scarce, only small lots of forging steel being obtainable from local makers. The advance in structural steel has stimulated buying for next year's delivery, and a fair tonnage for that shipment has been entered on mill books since that announcement. Specifications for steel bars continue very heavy, all producers reporting an overwhelming influx of shipping instructions. A meeting of shafting manufacturers was held in Chicago last Friday, at which present prices were reaffirmed. For several weeks past, there has been more or less cutting in this product and the meeting was called to obviate this if possible. Bar iron is strong at .1.70c, all the local sellers finding business very brisk at that price. The heavy purchases of cars and the firmness of the scrap market have given to bar iron producers an unbending attitude and they confidently look for a considerably higher market before the end of the year. Inquiries for sheets and merchant pipe are numerous, consumers taking advantage of the present weakness in these products to buy as far ahead as mills will permit.

Pig Iron.—There is a decided tendency towards higher prices in the local market and an advance in Northern and Southern irons is looked for within the next fifteen or thirty days. In the aggregate, a good-sized tonnage is under negotiation for next year's delivery, the sharp improvement in these requirements having greatly strengthened the market. One of these inquiries is for 5,000 tons; another from Racine is for 3,000 tons, one from the Pullman Co. for 2,500 tons, and several of 1,500 and 1,000 tons each. Nearly all the standard Southern brands are firm at $12 Birmingham, and while there continues to be more or less selling at $11.75, it generally transpires that the iron sold at this figure is either a little off in grade or is sold on an analysis that permits of a reduction from the straight No. 2 basis. Occasionally, a buyer for spot shipment can get the lower price by buying from a furnace with a freight differential, but the strictly standard Birmingham irons are held firmly at $12. The situation is still stronger with local furnaces, and but for the selling in this market of Ohio irons prices would quickly advance above their present level. As it is, one local interest is asking $16.75 and $17 for its No. 2, and is disposing of only small lots at these prices. The local stacks have shared in the inquiry for next year's deliveries, but have not as yet named prices on these requirements. Our quotations are as follows:

Lake Superior charcoal	$17.00 to 17.50
Northern Foundry No. 1	16.75 to 17.00
Northern Foundry No. 2	16.25 to 16.50
Northern Foundry No. 3	15.75 to 16.00
Northern Scotch Foundry	16.75 to 17.00
Ohio Strong Softeners No. 1	16.80 to 17.30
Ohio Strong Softeners No. 2	16.30 to 16.80
Southern Foundry No. 1	15.90 to 16.15
Southern Foundry No. 2	15.40 to 15.65
Southern Foundry No. 3	14.90 to 15.15
Southern Foundry No. 4	14.65 to 14.90
Southern No. 1 Soft	15.90 to 16.15
Southerd No. 2 Soft	15.40 to 15.65
Southern Gray Forge	14.40 to 14.65
Southern Mottled	14.15 to 14.40
Southern Silveries (4 percent to 6 percent Silicon)	16.65 to 17.65
Jackson Co. Silveries (8 percent to 10 percent Silicon)	19.30 to 19.80
Alabama and Georgia Car Wheel	20.15
Malleable Bessemer	16.25 to 16.50
Basic Iron	16.65

Billets.—An occasional order for forging steel is booked by local makers, but aside from this, there is nothing doing in this market. Forging billets are quoted from $30 to $32, with premiums above this price for quick shipment.

Bars.—The demand for bar iron shows increased growth. Local mills are asking from 1.65c to 1.70c Chicago, the lower price being offered only to favorable buyers. One instance in which it was obtained was on an order for 3,000 tons which was placed last week. All the Western mills are operating to their fullest capacity. Specifications for steel bars are also very heavy and mills are working night and day to keep pace with the requirements of their customers. We quote carload lots, Chicago delivery, as follows: Bessemer and open-hearth bars and bands, 1.66½c, half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 1.81½c base, full extras. Hard steel angles, 1.60c. There is a brisk demand from store and prices are strong. We quote bar iron, 1.95c base, full extras; soft steel bars and bands, 1.85c to 1.90c base, half extras; soft steel angles, channels and tees, under 3 in., 1.95c to 2c; hoops, 2.20c base, full extras.

Sheets.—Demand continues of good proportions. Quick deliveries are not easy to obtain and prices have strengthened to some extent. We quote carload lots, mill shipments, Chicago delivery, as follows: Blue annealed sheets, Nos. 9

and 10, 1.76½c; Nos. 11 and 12, 1.81½c; Nos. 13 and 14, 1.86½c; Nos. 15 and 16, 1.96½c. On box annealed, one pass cold rolled, we quote: Nos. 18 and 20, 2.16½c; Nos. 22 and 24, 2.21½c; Nos. 25 and 26, 2.26½c; No. 27, 2.31½c; No. 28, 2.41½c; No. 29, 2.51½c. We quote on lots from warehouse stocks as follows: No. 10, 2.10c to 2.15c; No. 12, 2.15c to 2.20c; No. 14, 2.20c to 2.25c; No. 16, 2.30c to 2.35c; Nos. 18 and 20, 2.45c to 2.50c; Nos. 22 and 24, 2.50c to 2.55c; No. 26, 2.55c to 2.70c; No. 27, 2.70c to 2.75c; No. 28, 2.80c to 2.85c; No. 29, 2.95c to 3c. Galvanized sheets, mill shipments, Chicago delivery, are quoted as follows: Nos. 12 and 14, 2.36½c; No. 16, 2.51½c; Nos. 18 and 20, 2.66½c; Nos. 22 and 24, 2.81½c; No. 26, 3.01½c; No. 27, 3.21½c; No. 28, 3.41½c; No. 29, 3.66½c. Jobbers' prices on small lots from store, are as follows: Nos. 10 to 14 inclusive, 3.05c; No. 16, 2.95c; Nos. 18 and 20, 3.05c; Nos. 22 and 24, 3.20c; No. 26, 3.45c; No. 27, 3.65c; No. 28, 3.90c; No. 29, 4.35c; No. 30, 4.80c.

Structural Steel.—Following the announcement of the advance in prices, a fair amount of business has been booked by local sellers for next year's delivery. Shipments from mills are very slow, and jobbers and fabricators are hard pressed to keep their stocks full. We quote carload lots, mill shipments, Chicago delivery, as follows: Beams and channels 3 to 15 in., inclusive, 1.86½c; angles, 3 to 6 in., ¼ in. and heavier, 1.86½c; angles larger than 6 in. on one or both legs, 1.96½c; beams larger than 15 in., 1.96½c; zees, 3 in. and over, 1.86½c; tees 3 in. and over, 1.91½c, with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. We quote prices from store as follows: 2.20c to 2.30c for angles, beams and channels, base sizes, with 2.30c to 2.40c for 18, 20 and 24-in. beams; tees and zees, 2.25c to 2.35c. These prices are for either random lengths or cut to specifications in excess of 5 ft.

Plates.—No cessation is noted in the brisk demand that has been felt all summer. Mills are feeling the pressure more keenly than ever before, and the ability of some interests to give quick deliveries is not as easy as it was several weeks ago. Local jobbers are doing an especially heavy trade, and while it is made up in large measure of small business, the number of orders handled is very large. Prices are strong at following quotations: Chicago delivery, carload lots, tank steel, ¼ in. and heavier, up to 100 in. wide, 1.76½c; base Chicago; flange steel, 1.86½c base; marine steel, 1.96½c base, all full extras. Plates, 3-16 in. thick, $2 extra; gauges 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Jobbers report a good movement from local stocks with store prices firm. We quote on small lots as follows: Tank steel, ¼ in. and heavier, up to and including 72 in. wide, 2c to 2.10c; over 72 in. wide up to 100 in., 2.10c to 2.20c; over 100 in. wide, usual mill extras, 3-16 in. up to but not including 72 in. wide, 2.10c; 3-16 in., 72 in. wide, 2.35c; flange steel, 25c extra; heads, 25c extra.

Rails and Track Supplies.—The South Chicago rail mill has less than a quarter of its output for 1906 unsold. Within the week past several orders have been closed up, aggregating over 100,000 tons. Outside mills have also booked a good sized tonnage during the week. There is a commensurate heavy demand for light rails, relaying rails and track supplies, one order for spikes being for 4,000 tons. We quote heavy sections in 500-ton lots, f. o. b. mill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12-lb. sections, $28.50; 16-lb. $27.50; 20-lb. $26.50; 25-lb. $25.50; 30, 35, 40 and 45-lb. sections, $24 to $24.50; all f. o. b. Milwaukee mill. Track supplies, f. o. b. Joliet mill: angle bars, 1.50c to 1.55c; spikes, first quality, 1.75c to 1.80c; track bolts, 3¼ x ¾, with square nuts, 2.40c to 2.50c, per lb., with hexagon nuts, 2.55c to 2.65c.

Merchant Steel.—Specifications continue very heavy and to the full capacity of mills. Prices are firm and without change. The meeting of shafting manufacturers in Chicago last Friday, at which prices were reaffirmed, was primarily called to discuss a means to stop the cutting that had been indulged in for several weeks during which as high as 55 percent discount had been quoted. It resulted in an agreement of all present to adhere strictly to card rates. We quote carload lots, mill shipments, Chicago delivery, as follows: Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c to 2.40c; smooth finished machinery steel, 1.91½c; smooth finished tire, 1.86½c; plow steel, 2.20c and upwards, according to quality; toe calk steel, 2.21½c; railway spring, 1.86½c. Cold rolled shafting, 50 percent off in carload lots, and 45 percent in less than carload lots. Crucible tool steel, 6½ to 8c; special grades of tool steel, 13c and up.

Cast Iron Pipe.—The only inquiry of importance pending is one from Portland, Ore., for several thousand tons of pipe which will be awarded Oct. 12. Prices are very firm, the recent advance being well maintained. We quote carload lots, f. o. b. Chicago, as follows: 4-in. water pipe, $29.50; 6, 8 and 10-in., $28.50; 12-in. and larger, $27.50, with $1 extra for gas pipe.

Merchant Pipe.—The demand for all sizes of pipe, black or galvanized, is very brisk. Price conditions are unchanged, and discounts as high as 80 percent Pittsburg are easily obtained. For purposes of comparison, however, we continue to quote the card rates of the leading producers, which, while they have not been adhered to for several weeks, have never been officially changed.

MERCHANT PIPE.

	Steel.		Iron.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¼ inches	65.85	49.85	63.85	47.85
⅜ to ½ inches	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	72.35	62.35
7 to 12 inches	68.85	53.85	67.35	51.85

PLUGGED AND REAMED.

	Steel.		Iron.	
1 to 4 inches	71.35	61.35	69.85	59.85

EXTRA STRONG PIPE.

⅛ to ⅜ inches	58.85	46.85	56.85	44.85
½ to 4 inches	65.85	53.85	63.85	51.85
4½ to 8 inches	61.85	49.85	59.85	47.85

DOUBLE EXTRA STRONG PIPE.

½ to 8 inches	54.85	43.85	52.85	41.85

Boiler Tubes.—The trade of the week past was of excellent proportions. All classes of consumers are specifying freely and mills are sold far ahead. Prices are firm but without change. We quote carload lots, Chicago delivery, as follows:

BOILER TUBES.

	Steel.	Iron.	Seamless.
1 to 1½ inches	40.35	37.35	53.00
1¾ to 2¼ inches	54.35	39.35	40.00
2½ inches	56.35	44.35	43.00
2¾ to 5 inches	62.35	51.35	Up to 4½ inches 50.50
6 to 13 inches	52.35	37.35	

Less than carload lots from store, as follows:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches, inclusive	40	35	42½
1¾ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	30
2¾ to 5 inches, inclusive	60	47½	42½

Wire Products.—Prices have been advanced $1 per ton, effective Sept. 12. An excellent business in all wire products is reported. We quote carload lots, mill shipments, Chicago delivery, as follows: Wire nails, $1.90; painted barb wire, $2.05; galvanized barb wire, $2.35; smooth annealed wire, $1.75; smooth galvanized wire, $2.05; polished staples, $2.00; galvanized staples, $2.30.

Coke.—The scarcity of cars at Connellsville is causing considerable hardship to Western melters. The shipments from the East have showed a steady decline since the first of the

month, and it is impossible now to get spot coke without paying a premium of 25 cents to 50 cents a ton for it. Connellsville furnace coke for future delivery, however, is still quoted from $2 to $2.10 at the ovens; and standard 72-hour grades, $2.50 ovens. Wise County coke is strong at $4.75 to $4.85.

Old Material.—The local situation is without material change. Trading is light, although all the large consumers are known to be ready to buy. The complaint that scrap is too high is offset by the statement of dealers that it cannot be bought from the producers at much less than they are offering it to mills. The only new railroad list out is the one from the Santa Fe for about 4,000 tons. It is said there is sharp bidding for the various materials offered. The demand for relaying rails is especially heavy, electrical roads having to use them because of their inability to get shipments from mills. We have changed several of our prices, and quote gross tons, as follows:

Old steel rails (4 feet and over)	$14.25 to 14.50
Old steel rails (less than 4 feet)	14.00 to 14.50
Old iron rails	19.00 to 19.50
Relaying rails, subject to inspection	23.00 to 24.00
Heavy melting steel	13.50 to 14.00
Mixed country steel	11.50 to 12.00

We quote as follows net tons:

No. 1 R. R. wrought	16.00 to 16.50
No. 2 R. R. wrought	15.00 to 15.50
Shafting	15.50 to 16.00
Dealers' forge, No. 1	12.00 to 12.50
Wrought pipe and flues	11.00 to 11.50
No. 1 cast, 150 lb. and less	13.50 to 14.00
No. 1 mill	9.00 to 9.50
No. 1 Busheling	11.50 to 12.00
No. 2 Busheling	11.00 to 11.50
Country sheet	7.50 to 8.00
No. 1 boilers, cut	11.00 to 11.50
Boiler punchings	13.50 to 14.00
Iron car axles	23.00 to 23.50
Steel car axles	17.00 to 17.50
Iron axle turnings	10.75 to 11.00
Cast borings	8.00 to 8.50
Mixed borings, etc	8.00 to 8.50
Machine shop turnings	10.25 to 10.75
Railroad malleable	13.50 to 14.00
Agricultural malleable	13.00 to 13.50
Stove plate and light cast scrap	11.00 to 11.50
Old iron splice bars	17.00 to 17.50

CINCINNATI.

Firm Undertone, but low Prices of Recent Dates are Still Heard.

September 13.

Pig Iron.—The inquiry for iron during the week has been fairly good and the market shows a firm undertone, although recent minimum prices are still occasionally heard of. A sale of 1,000 tons of gray forge in Indiana for first quarter delivery at $10.25 Birmingham has been reported, and sales to an Ohio concern of about 2,000 tons of No. 2 soft, a part of which went at $11.50 Birmingham, are among the transactions of the week. A fairly good tonnage for first quarter delivery of Northern and Southern iron went to an Indiana melter at $12 Birmingham on Southern iron. There were also 700 tons of car wheel iron and some Northern iron sold to the same concern on which prices were not made public. Two inquiries, one for 600 tons of foundry grades and one for 1,000 tons of gray forge for first quarter delivery come from Louisville, Ky. A 3,000 ton inquiry from Pittsburg for gray forge for September and October delivery is about to be closed. An Ohio melter has taken on 700 tons for first quarter delivery, which order went to Southern Ohio furnaces. An inquiry for 5,000 tons of basic iron and another from a soil pipe concern for 6,000 tons of foundry iron for September and October delivery are also reported. An inquiry which was in last week for 3,300 tons of foundry grades will probably be closed this week. It will be noted that there is an increasing tendency on the part of melters to make purchases for first quarter deliveries and sales agencies advise that their correspondence indicates more interest in this direction from week to week. As a rule furnaces are not prepared to quote prices for next year and express a view that the situation warrants expectation of higher prices next year than now prevail.

There is still evidence of an abundance of the lower grades of iron such as No. 4, gray forge, mottled and white iron, which furnaces are prepared to offer at slight concessions in order to clear their yards. An element in the situation which tends to give the selling interests confidence, is the absence of requests from melters to hold up shipments. Orders placed in July are coming forward fairly well and melters are accepting deliveries without complaint, and in some cases are asking for as prompt movement as possible. It was believed in some quarters that the buying in July would cover the requirements of most of the consumers for the balance of the year and requests to hold up shipments were anticipated. This feature of the situation makes it appear that melters are consuming heavily and it is believed that the requirements are exceeding expectations. This is confirmed by the good scattering demand for delivery in the last quarter. Sales of Southern iron are still occasionally made at $11.50 Birmingham basis, but there is an increasing tendency on the part of Southern furnaces to hold for $12. In Southern Ohio the market shows more firmness, and while some recent sales have been made at $14 for No. 2 foundry, the general quotation is now $14.25 to $14.50 for No. 2 at furnace. We quote f. o. b. Cincinnati as follows:

Southern Foundry No. 1	$14.75 to 15.25
Southern Foundry No. 2	14.25 to 14.75
Southern Foundry No. 3	13.75 to 14.25
Southern Foundry No. 4	13.50 to 14.00
Southern Foundry No. 1, soft	14.75 to 15.25
Southern Foundry No. 2, soft	14.25 to 14.75
Gray Forge	13.00 to 13.75
Northern Foundry No. 1	15.90 to 16.15
Northern Foundry No. 2	15.40 to 15.65
Northern Foundry No. 3	14.90 to 15.15
Jackson County Silvery, 8 percent	18.15
Southern Charcoal	18.25 to 18.75

Finished Material.—There is an active demand and the market is firm for practically everything on the list. The demand in bar iron is well maintained. Bar iron is quoted at 1.65c to 1.70c; steel cars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets, No. 10 and No. 12, in car lots are 2.48c. We quote black sheets, No. 27 at 2.30c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 10, 2c. Tank plates are firm and sell out of store at 2c for ¼ in. and 2.10c for 3-16, No. 8 and No. 10. Beams and channels are quoted at 2.25 to 2.50c from stock and angles at 2c to 2.05c for base sizes.

In merchant pipe there is still some irregularity in prices, but the leading interest has not changed its schedule. Independent mills are competing for desirable tonnage and concessions are being granted. We quote f. o. b. Cincinnati:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black.	Steel Pipe. Galv.	Guaranteed Wrought Iron Pipe. Black.	Guaranteed Wrought Iron Pipe. Galv.
	Percent.	Percent.	Percent.	Percent.
⅛ and ¼ inches	65.35	49.35	63.35	47.35
⅜ and ½ inches	69.35	57.25	67.35	55.35
¾ to 6 inches	73.35	63.35	75.85	61.85
7 to 12 inches	68.35	53.35	66.85	51.35

Old Material.—The supplies are firmly held and the market is strong for the entire list. Quotations have not advanced, but holders are demanding full prices, and looking for iron now on hand to sell for better figures later on. We quote:

Old No. 1 railroad wrought, net tons	$14.00 to 15.00
Cast machine and foundry, net tons	12.00 to 13.00
Old iron rails, gross tons	20.00 to 21.00
Old steel rails, gross tons	15.00 to 16.00
Old short lengths, gross tons	14.00 to 15.00
Old iron axles, net tons	20.00 to 21.00
Stove plate, net tons	9.50 to 10.00
Wrought turnings, net tons	9.00 to 10.00
Cast borings, net tons	7.50 to 8.00
Car wheels, net tons	14.00 to 14.50

Coke.—The market is active and strong with some prices advanced. Inquiries for next year delivery are frequent and some contracts for the first half of next year have been placed. Ovens are showing more firmness and some are withdrawing from the market, while others are asking higher prices. Shortage of cars in the coke producing districts is interfering with the movement. Prices in the various coke producing districts are as follows f. o. b. ovens:

†Wise County, Va. Furnace Coke prompt shipment.	$2.15 to $2.25 per ton
Wise County, Va. Foundry Coke on contracts	2.40 to 2.50 per ton
Pocahontas Furnace Coke on contracts	2.00 to 2.10 per ton
Pocahontas Foundry Coke on contracts	2.25 to 2.50 per ton
*Connellsville Furnace Coke on contracts	2.00 to 2.10 per ton
*Connellsville Foundry Coke on contracts	2.50 to 2.75 per ton
Kanawha Furnace Coke on contracts	2.00 per ton
Kanawha Foundry Coke on contracts	2.35 to 2.50 per ton

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices.
*Connellsville Coke inside prices apply to "main line" ovens and not to strictly Connellsville Coke.

BIRMINGHAM.

Improvement in Low Grades of Pig Iron—Prices are Firm.

BIRMINGHAM, ALA., Sept. 11.—The demand for pig iron in the Birmingham district shows a slight improvement, and while the active buying for the last quarter of the year is not on yet in full force, the indications are strong that a large quantity of iron will be needed to meet all demands. There is much iron to be seen on the furnace yards in this district, but the statement is made that this product has been sold to brokers and consumers and only awaits instructions as to delivery. The railroads are furnishing all the cars being asked for with which to make deliveries. Some few orders have been booked in this section for delivery during the first quarter of the coming year, but the policy of the manufacturers in this district is not to sell too far ahead. During the past week one company at least in this section called a halt on the sales of low grade iron. The demand for No. 4 foundry and gray forge became so persisent that the company was forced to withdraw from the market. There is no concession being made further on low grade iron to secure business, and it is given out that the same firmness noted on No. 2 foundry and other grades is a fact with those under No. 3 foundry.

The iron production in the Birmingham district is holding up well, though the supply of raw material is not as steady as it might be, the labor situation being responsible to a great extent for this condition. The Tennessee Coal, Iron & Railroad Co. will be able to blow in its last Bessemer furnace the latter part of this or the middle of next week. The Quinn furnace at Gadsden (charcoal), is now ready for the torch and it is expected that the plant will be producing iron before the end of the month. The Shelby Iron Co. has made a change on one of its furnaces so that coke iron can be produced, if desired. There is some probability of coke iron being made with one of these furnaces while charcoal iron is produced on the other. The demand for charcoal iron is far from being satisfactory, in fact the market is termed dull. The coke iron furnaces in blast are doing well, considering the obstacles above narrated.

Iron quotations are very firm, No. 2 foundry being on a $12 basis. The following prices are given in this district for iron: No. 1, foundry, $12.50; No. 2, foundry, $12; No. 3, foundry, $11.50; No. 4, foundry, $11; gray forge, $10.50; No. 1, soft, $12.50; No. 2, foundry, $12.

The home consumption is still large, the cast iron pipe plants, soil pipe factories, the foundries and machine shops all having need for a large quantity of iron. It is announced that the Coosa Pipe & Foundry, whose little soil pipe factory is located at Gadsden, near the furnaces of its parent corporation, the Alabama Consolidated Coal & Iron Co., has found it necessary to decline some business because of the aggregate business in hand already. It is learned that overtures have been made to this plant to become interested in the "association," but no reply has been given. The plant expects to shortly have its machinery turning out the full capacity, fifty tons a day.

The Western Steel Car & Foundry Co. which operates the old car plant at Anniston, Ala., announces that it will build a malleable iron foundry at once at that place. The old malleable iron foundry was destroyed by fire several years ago. Recently it was ascertained that such a foundry was absolutely necessary and arrangements are now being made to the end mentioned. The foundry will involve an expenditure of $50,000.

Rumors prevail that the American Car & Foundry Co. is about to begin arrangements looking to the erection of a large plant in this section.

The Birmingham Belt railroad, a terminal railroad owned and controlled by the Frisco system, the great Western railroad, has just completed a deal for the purchase of nearly 200 acres of land near North Birmingham alongside of Village Creek. The railroad will use this land for yard and shop purposes and also for industries which can be attracted to this district. The railroad facilities and the water supplies will be used as inducements.

There is no change in conditions at the steel plants at Ensley and the various industries are in full operation and making steady deliveries on old orders. At the rail plant the product is being hauled off about as rapidly as it is being manufactured.

At the meeting of the directors of the Sloss-Sheffield Steel & Iron Co. this week in New York, the matter of issuing more common stock and distributing same among the stockholders will be taken up and passed on favorably. The report of President J. C. Maben, of this company, shows another addition to the surplus fund for the past quarter. There is no revival of merger talk nor of the rumor that the Sloss-Sheffield Steel & Iron Co. intends the erection of a steel plant in this district in the near future.

CLEVELAND.

More Orders for Ship Plates Placed—Pig Iron Prices are Advancing.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, September 13.

Weather conditions at the head of the lakes have changed since last week and shipments of ore are now being made much more rapidly. The docks at the upper lake ports are in good condition and receipts the latter part of this week at Lake Erie ports will be very heavy. There is practically no chartering of wild tonnage.

Pig Iron.—The market is much stronger, and it is expected that if the Steel Corporation makes another purchase of Bessemer within a week, as it probably will, there will be a further advance. Cast iron pipe interests have closed for a considerable tonnage of No. 3 foundry and a large amount of malleable has been purchased. Basic and Bessemer are held firmly at $15 valley furnace, and the tendency of prices for foundry irons is upward. An inquiry for 10,000 tons of basic for the first quarter of 1906 is pending. A number of sellers of foundry pig iron are refusing to accept less than $15 valley, and the quotation of the Cleveland furnaces for local delivery is now $15 at the plants. There are few furnaces, however, still willing to shade $15 valley. The coke market is active and the

scarcity of cars mentioned last week is more pronounced. We quote as follows, Cleveland delivery:

Bessemer	$15.85 to 16.10
No. 1 Foundry	16.00 to 16.50
No. 2 Foundry	15.00 to 15.85
No. 3 Foundry	14.50 to 15.00
No. 2 Southern	15.25 to 15.85
Gray Forge	14.25 to 14.50
Gray Forge, Southern	14.00 to 14.25
Lake Superior charcoal	16.25 to 16.50

Finished Material.—The demand for plates, rails and shapes continues unabated. Another large order for ship plates has been placed. Although a large business in sheets is being transacted, quotations are ragged. Pipe business is still dull. The failure of sheets and pipe to improve in harmony with the demand for other finished material is an interesting feature of the present market. Bar iron is stronger than it has been for many months, some mills being sold ahead beyond their capacity for the first quarter of 1906. There is the usual irregularity in shafting, although recent efforts of manufacturers may have some effect in supporting prices. The prices of wire products have been advanced $1 per ton and advances on other products are expected.

Old Material.—The market is strong, but prices have not changed. We quote for Cleveland delivery as follows:

Old iron rails	$22.50 to 23.50
Old steel rails (over 6 feet)	15.50 to 16.50
Old steel rails (under 6 feet)	16.50 to 17.50
Old car wheels	15.00 to 15.50
Steel boiler plate	12.00 to 13.00
Steel axles	18.00 to 19.00
Malleable iron (railroad)	15.00 to 16.00
Malleable iron (agricultural)	14.00 to 15.00
Heavy steel	15.50 to 16.00

We quote as follows, net tons:

No. 1 R. R. wrought	15.00 to 16.00
No. 1 busheling	13.50 to 14.50
No. 1 machine cast	13.25 to 13.75
Iron axles	21.00 to 22.00
Axle turnings	11.50 to 12.50
Wrought turnings (free from cast)	10.50 to 11.50
Grate bars	8.50 to 9.50
Pipes and flues	12.50 to 13.50
Tank iron	10.00 to 10.50
Hoop and band iron	8.00 to 9.00
Sheet iron	7.00 to 8.00
Wrought drillings	10.50 to 11.50
Stove plate	10.00 to 10.50
Cast borings	8.50 to 9.50

NEW YORK.

Great Orders for Steel Overshadow in Interest Transactions in All Other Products—Pig Iron Market Fairly Active.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., September 13.

Pig Iron.—Steel has been the dominating factor even in the local pig iron market this week. Less than half the total sales of the week were made up of foundry iron, which usually furnishes the bulk of the transactions. Although business has been good and inquiry fairly active, only between 15,000 and 20,000 tons of foundry iron were sold, while something more than 20,000 tons of basic were disposed of and about 10,000 tons of low grade pig. Many of the Northern and Eastern furnaces have increased their demands by 25 and 50 cents a ton, but sales at the advanced figures have not as yet been large. Producers of basic iron are asking 75 cents and a dollar more than current quotations, but no transactions establishing these higher prices have been reported. Speculations are rife in the local trade as to the possible effect of the withdrawal of the Wharton furnace from the pig iron market. Rumors concerning the sale of these valuable properties to a leading steel concern are as persistent as the denials are vigorous and unqualified. It may be stated on what should be the best authority that the deal has not been consummated, and that negotiations with that end in view are not at present in progress. That something of the sort is possible in the future is not denied. The sales of foundry iron effected during the week include 1,000 tons of No. 2 Pennsylvania, 500 tons each of Virginia, New York state and soft Alabama, 700 tons of Alabama, 3,000 tons of Northern, and a number of small lots of Northern foundry grades and special analysis irons. The following are prices at tidewater:

Northern No. 1 Foundry	$16.75 to 17.00
No. 2 Foundry	16.00 to 16.25
No. 2 Plain	15.50 to 15.75
No. 1 Southern Foundry	16.25
No. 2 Southern Foundry	15.50 to 16.00
No. 3 Southern Foundry	15.25
No. 4 Foundry	14.50 to 14.75

Pig Iron Certificates.—Trading in pig iron certificates on the New York Produce Exchange was inconsiderable during the past week. The tone of the market continued easier and prices were generally lower. Foundry iron warrants follow:

	Bid.	Asked.
October	15.00	15.40
November	15.20	15.50
December	15.20	15.60
February	15.40	15.75

Finished Iron and Steel.—The enormous tonnages for steel rails and other steel products placed by the railroads continue to be the feature of greatest interest.

New business in structural material is being secured and the estimating department of the American Bridge Co. was never so busy as at present. In view of the great number of building permits issued recently, the expectation that many orders are to be placed within the near future seems to be well founded. The fact that steel plates have been sold at a premium gives rise to fresh rumors that the price of this product is soon to be advanced. Importations of foreign billets in small lots are reported. The following are prices at tidewater: Angles, 3 to 6 in. x ¼ in. and heavier, 1.84½c; beams, 3 to 15 in., 1.84½c; tees, 3 x ¼ in. and heavier, 1.89½c; plates, carloads, tank 1.74½c; flange, 1.84½c; marine and ordinary firebox, 1.94½c; refined iron bars, 1.60c; soft steel bars, 1.64½c to 1.67c; sheets in carload lots, New York, No. 28, black, 2.40c.

Old Materials.—The demand has not been uniformly active and a movement to check the advance in prices has been suspected, but its effect upon the market has not been apparent. Wrought material continues to receive the most attention with cast scrap a close second. Although the demand for steel scrap has fallen off, the prices are if anything more firm than a week ago. The following prices are f. o. b. approximately, at tidewater:

Old iron rails	$20.00 to 21.00
Old steel rails, long lengths	14.50 to 15.00
Old steel rails, short pieces	14.00 to 14.50
Relaying rails	22.50 to 23.00
Old car wheels	15.00 to 16.00
Old iron car axles	21.00 to 22.00
Old steel car axles	18.50 to 19.00
Heavy melting steel scrap	13.50 to 14.00
No. 1 railroad wrought scrap	17.00 to 18.00
Iron track scrap	15.00 to 16.00
Wrought pipe	12.00 to 13.00
Cast borings	8.50 to 9.00
Wrought turnings	12.25 to 12.75

The Davis Foundry & Machine Works, Rome, Ga., is in the market for the immediate purchase of a 10-ft. vertical boring and turning mill, two heads, one milling machine for general machine shop work, one planer about 44 to 48 in. square by 9 to 10 ft. long, two traveling cranes, hand power, about seven-ton capacity, 35 ft. span, one small compressed air outfit for drilling and chipping, one 26 in. x 12 ft. lathe and one keyseating machine that cuts a keyseat up to 2 in. wide x 16 in. long. Second-hand machinery in first-class condition will be considered.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., September 13.

Pig Tin.—During the first of the week the tin market showed considerable weakness and suffered a decline, but the later half brought a reaction, and the close was steady. Today's closings follow: Spot, 32.20c to 32.40c; September, 32.20c to 32.35c; October, 32.05c to 32.35c; November, 32 to 32.30c; London, £147 5s and £146 12s 6d. Arrivals, 1,215 tons to date, with 2,910 tons afloat.

Copper.—There has been very little business in copper, the market being dull and nominal. Today's closings: Lake and electrolytic, 16c to 16½c; casting, 15¾c to 16¼c. London's closing today: £69 12s 6d and £69 10s. Exports for the month, 2,793 tons.

Lead.—The demand for all grades of pig lead has been fair and prices unchanged at: 4.85c to 4.90c; St. Louis, 4.77½c; London, £13 17s 6d.

Spelter.—A slightly better demand brought a stronger feeling. Prices rule firm. Closing quotations today were: Spot, 5.80c to 5.90c; St. Louis, 5.70c; London, £26.

Antimony.—The market has been dull and prices remain unchanged. Cookson's and Hallett's 14c, and other grades 12c to 13c.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1161 MONADNOCK BLOCK, September 13.

Further weakness has developed in copper as a result of stock market manipulations, the decline to date being one-quarter of a cent. Other metals are without change as to price, a strong current demand being felt for all. We quote lake copper, 16¾c for carload lots, Chicago, and 17c for less than carload lots. Casting copper, 16½c for carload lots, and 15¾c for less than carload lots. Spelter is firm at 5.85c for carload lots, and 6⅛c for lesser quantities. Sheet zinc, 7¼c for carload lots of 600-lb. casks, and 7½c for less than carload lots. Pig lead, 4.85c for 50-ton lots, 4.90c for carload lots and 5c to 5⅛c for less than carload lots. There is a scarcity of antimony, and Hallett's is still quoted firm at 17c. Cookson's, 18c.

There is a strong feeling in old metals, demand being good and prices very firm. Dealers' quotations are approximately as follows:

Copper wire, 13¾c; heavy copper, 13¼c; copper bottoms, 12c; copper clips, 13c; red brass, 12½c; red brass borings, 10c; yellow brass, 8¾c; yellow brass borings, 8¼c Pipe lead, 4c; tea lead, 3.75c; zinc, 4c.

The Oregon Foundry & Machine Co., Oregon, Ill., has, as the result of largely increased business, increased its capital to $20,000 and placed orders for considerable equipment.

The Pennington Boiler & Foundry Co., West Eglantine avenue, Pennington, N. J., has been incorporated with a capital of $100,000 to conduct a general foundry and machine shop. The incorporators are: Thomas T. Burchfield and Frank T. Glenn, both of No. 830 Perry building, Sixteenth and Chestnut streets, Philadelphia, Pa., and Joseph W. Sheeler, Pennington, New Jersey.

A meeting of the Susquehanna Iron & Steel Co.'s directors to be held soon will open the way for a consideration of the advisability of applying for release from the receivership. It is reported that such action is looked upon favorably by a number of stockholders.

A FEATURELESS WEEK

Declines Followed By Slight Recovery—Gold Importation Relieves Money Situation.

The market during the past week has been in the main devoid of unusual features. A continuance of dullness and declines of the preceding week brought profits to the bear interest and the depressing effect of the tight money market made trading limited and prices wavering. Toward the latter part of the week a slight return of strength was felt, and on the last day the announcement of the importation of gold from Europe, probably in large quantities, brightened everything materially. The prominent railroad stocks and United States Steel have been the features of the week in a dull way, and the industrials, together with the grain reports have constituted the only supporting influence.

	Sept. 4	Sept. 11	Changes
Allis-Chalmers Co	15½	16⅜	+1⅜
Allis-Chalmers preferred	53⅜	59	+5⅝
American Can	11⅛	11¼	.....
American Can preferred	70¼	69⅛	—1
American Car and Foundry	35⅛	35⅜	— ⅜
American Car and Foundry preferred	100⅛	100¾	+ ¼
American Locomotive	50	48⅝	—1⅜
American Locomotive preferred	112¾	112	— ¾
American Shipbuilding	52⅛	53¾	+1¾
American Shipbuilding preferred	105	105	.....
American Steel Foundries	9	8½	— ½
American Steel Foundries preferred	39⅝	39	— ⅝
Barney & Smith	20	20	.....
Barney & Smith preferred	128½	128½	.....
Bethlehem Steel	31¼	30	—1¼
Bethlehem Steel preferred	88	88	.....
Bullock preferred	113	114	+1
Cambria Steel	26⅞	26¾	— ⅛
Colorado Fuel & Iron	43	42	—1
Crucible Steel	12½	12½	.....
Crucible Steel preferred	64	64½	+ ½
Empire Steel	6	....	.....
Empire Steel preferred	35	....	.....
Fay & Egan	60	60	.....
Fay & Egan preferred	120	120	.....
General Electric	180	179	—1
International Pump	27½	26	—1½
International Pump preferred	82	82	.....
Lake Superior Corporation	17	17	.....
Niles-Bement-Pond	126½	126½	.....
Niles-Bement-Pond preferred	108	108	.....
Niles Tool Works preferred	130	130	.....
Otis Elevator Co	60	60	.....
Otis Elevator preferred	107	106	—1
Pittsburg Coal Co	13¾	13½	— ¼
Pittsburg Coal preferred	53	54	—1
Pressed Steel Car	43¾	42½	—1¼
Pressed Steel Car preferred	95½	95¼	— ¼
Pullman Palace Car	247	246	—1
Railway Steel Spring	36¼	35	—1¼
Railway Steel Spring preferred	99	98½	— ½
Republic Iron & Steel	20¼	20⅛	— ⅛
Republican Iron & Steel preferred	88⅞	88½	— ⅜
Sloss-Sheffield	89	93¾	+4¾
Tennessee Coal & Iron	86	84	—2
U. S. Cast Iron Pipe & Foundry	30½	29⅞	— ⅝
U. S. Cast Iron Pipe & Foundry preferred	91⅓	.....	.....
U. S. Steel	36¼	35⅝	— ⅝
U. S. Steel preferred	103⅝	102⅝	—1
U. S. Steel 5's	97½	97	— ½
Virginia I. C. & C. Co	40½	40	— ½
Westinghouse Electric	166	166	.....
Westinghouse Air Brake	148¼	148⅛	— ⅛

Financial Notes.

The regular quarterly dividend of 1¾ percent was declared at the recent meeting of the directors of the American Car & Foundry Co.

The fiscal year of the Crucible Steel Co. ended Aug. 31, and the stockholders' meeting next month will probably be the occasion of the issuance of the annual report. The report of a year ago showed a decrease for the previous year, but it is anticipated that the statement for the year ending Aug. 31, 1905, will be favorable.

The American Can Co. has declared the regular quarterly dividend of 1¼ percent on the preferred stock, payable Oct. 2. Books close Sept. 16 and reopen Oct. 3.

The Fort Wayne Iron & Steel Co. has been adjudged bankrupt and B. F. Heaton and H. C. Rockhill have been appointed receivers. The mills, it is expected, will resume operations shortly in an attempt to carry the business on to a solid basis.

THE IRON TRADE REVIEW

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SEPTEMBER 14, 1905

Americans interested in the iron and steel business, visiting in Europe, will find The Iron Trade Review on sale at the office of the International News Co., Breams Buildings, Chancery Lane, London, E. C., England. Copies will be forwarded on request, from London to any address in the world.

THE VALUE OF SHIPBUILDING.

Ruskin says that man as a gregarious creature has never done anything greater than the building of a ship. The more one contemplates this the more impressive becomes its truth. The shipbuilder, who is credited with building the vessel, does nothing more than to assemble the various parts. Human energy had been expended on the craft in a variety of directions before the shipbuilder began his work at all. Especially is this true since steel has become the common material out of which ships are built. The days of the wooden ships are past. There is not now a wooden ship building on the great lakes; nor has there been one for the past three years. Orders for ships, therefore, are of primal interest to the steel maker and from him to the hundred and one diversified interests of which steel is the base. No single industry so completely vivifies all industries as ship building. From the very beginnng it pays a continuous tribute to labor. Iron ore is one of the cheapest of minerals. Lying in the ground it has an estimated value of $1 per ton. Out of two tons of it approximately one ton of steel can be made. When worked up into the form of a ship plate, it has a present value of $32 per ton. The difference represents labor and the cost of assembling the necessary materials for smelting. There is first of all the miner's wage to be paid; then the cost of transporting ore to shipping docks; then the cost of its long haul along the waterways of the great lakes to the receiving docks; then the cost of rail transportation to the furnaces. Incidentally handling charges accumulate, being wholly labor. To do this work economically the most solid railroads in the world have been built from the Lake Superior mines to shipping docks, which in themselves are wonders of modern convenience. The ore passes from the docks by gravity into ships that have been specially constructed for this single service —ships unlike any that are to be found elsewhere in the world and which rival ocean liners in size and strength. All this vast machinery, employing thousands upon thousands, is put into motion when a shipyard receives an order for a new steamer. In addition, countless subsidiary interests are employed, for the installation of auxiliary machinery and the fitting out of a vessel embraces a hundred arts.

A new era of ship building has set in on the great lakes. Since the first of the present year orders have been placed with lake shipyards for forty-three modern ore carriers, not to mention three package freighters and two car ferries. The total cost of these ships will approximate $15,000,000, of which 90 percent will actually have been paid out for labor. These numerous orders are contributing greatly to the prosperity of the workmen of the lake cities and afford as well splendid patronage to the steel makers.

Were the oversea trade of the United States reserved in some manner to the American ship by governmental promotion, its effect would be immediately felt throughout the country. No single act could so stimulate general prosperity because it would mean the immediate building of scores of ships and the money thus expended would go directly into the pockets of the American workman. It is safe to say that the protection of the American ship in oversea trade would in twenty years result in the expenditure of practically $800,000,000 in American shipyards. No investment that the government could make would yield a greater dividend or distribute it more widely. Every citizen would have a share in it. It is a condition which can be brought about, too, by the initial expenditure of a sum of money ridiculously small in comparison with the amount of private capital that would eventually be invested. It could be done by simply distributing the tonnage tax among American ships under the provisions of the shipping bill as presented to the last Congress by the Merchant Marine Commission.

SIGNIFICANCE OF RECENT IMPORTATIONS.

The contracts for foreign pig iron reported to have been placed in this country some weeks ago are not likely to affect the domestic market to any appreciable extent. The conditions under which the importations are possible are exceptional and influence the currents of trade only indirectly. It appears that some 60,000 tons of Bessemer iron have been secured in England by a steel maker on the Atlantic coast and that a pipe foundry similarly situated is to receive about a fourth of that amount of foundry iron also from a British

source. Neither of these shipments is intended for American consumption. It is understood that the steel making iron is to be converted into rails for export upon a contract made at least six months ago, and that the foundry iron will return across the ocean in the form of cast iron pipe also upon a contract months old.

It is only by taking advantage of the drawback provisions of our tariff laws that these importations are possible. The present price of foreign iron plus the duty and the transportation charges is considerably in excess of the cost of domestic iron. But by observing the necessary regulations the manufacturer can, upon the export of the same material in a finished form, obtain in drawbacks an amount only slightly less than that paid in duties. Since the orders for rails and pipe were booked some time ago and probably with the source of the material predetermined, it is difficult to see how these contracts for foreign iron can appreciably affect either the demand for domestic pig or the supply.

RECORD RAIL PRODUCTION PROMISED.

The programs of all roads for rail laying next year are very ambitious. The roads have all fallen behind during the last year and this in track renewal. Back in 1887, when a rail production was made which stood as the record for an even dozen years, the great bulk of the rails made went into new roads. Nowadays the great bulk goes into replacement, and after a period of two lean years the roads require an abnormal tonnage to regain their position. From these considerations it is conservatively estimated that rail production in 1906 will easily exceed 3,500,000 tons. Production in previous years has been as follows, the figures covering all kinds of rails:

UNITED STATES RAIL PRODUCTION, GROSS TONS.

1887	2,139,640	1896	1,122,010
1888	1,403,700	1897	1,647,892
1889	1,522,204	1898	1,981,241
1890	1,885,307	1899	2,272,700
1891	1,307,176	1900	2,385,682
1892	1,551,844	1901	2,874,639
1893	1,136,458	1902	2,947,933
1894	1,021,772	1903	2,992,477
1895	1,306,135	1904	2,284,711

PURIFICATION AND SMELTING OF IRON ORES BY ELECTRICITY.

Two articles in the present issue of *The Iron Trade Review* call attention to the fact that electricity is finding wider application in the iron business, in addition to the many other fields in which it is so usefully employed.

One of these articles describes the Ruthenberg process for the cleaning of magnetite ores, and for the concentration of fine ores and flue dust which cannot be used in the blast furnace without treatment. While the magnetic separation of ores is not new, the method of accomplishing the desired result, is, in the Ruthenberg process, somewhat unique.

The agglomerating of fine ores, and flue dust, so as to make them suitable for use in the blast furnace, has always been more or less of a perplexing problem. Many patents have been taken out for methods of utilizing these substances, which methods have been more or less successful. The chief bar to the use of fine ores is the question of expense. At the present price of ore it would not pay to spend any large amount on a briquetting or similar process, in order to render a rather poor ore fit for use in the blast furnace. The Ruthenberg process appears to have solved the problem, and to be able to treat the ore at a price which is not prohibitive.

The other article referred to is that by Horace Allen on the economy of the blast furnace. In it the losses due to the present methods of smelting iron are discussed, and the improvements which might be made are shown. The article is a purely theoretical discussion, and the figures used in the calculations are only approximate. The saving that is possible is based, by the author, on electric smelting, the figures for heat developed, lost and utilized by the coke and electric process being compared. The author does not offer any process, nor does he make any suggestion as to the way in which electricity is to be applied to effect the saving. He merely gives the figures and points the way, leaving the discovering of the process to others.

In view of the strides made by electricity in the past twenty-five years, and its application to so many uses for which it was at first deemed unsuitable, it is not safe to predict that it will not some day become the dominating feature of the iron and steel business, and cause the introduction of totally new processes.

Buttress for Prosperity.

The effect of the peace now concluded upon the finances of the world has been by no means discounted. The chances are that in Europe it will mean a time of industrial and commercial expansion on a considerable scale and of some considerable duration. As we have pointed out several times, huge masses of capital have been accumulated in anticipation of an indemnity loan, which will not now be needed, and this capital cannot fail to flow into channels of industry and commerce. This in turn can only further buttress the great prosperity which we now enjoy in this country.—[Wall Street Journal.

Not Scandalous at All.

[*New York Tribune.*]

Director Walcott's reply to the charges recently made against the Geological Survey meets them squarely and satisfactorily. He was aware that some of his employees held stock in a newspaper devoted to mining interests, but he sees no legitimate objection to their doing so. Neither does any other right minded person. Again, members of his staff did supply the periodical in question with occasional articles. This was done, however, with his knowledge and approval, the material thus furnished merely presenting in popular language facts which had previously been embodied in technical bulletins and reports of the bureau. Any one else was at liberty to do the same thing. Certainly the practice was not an abuse.

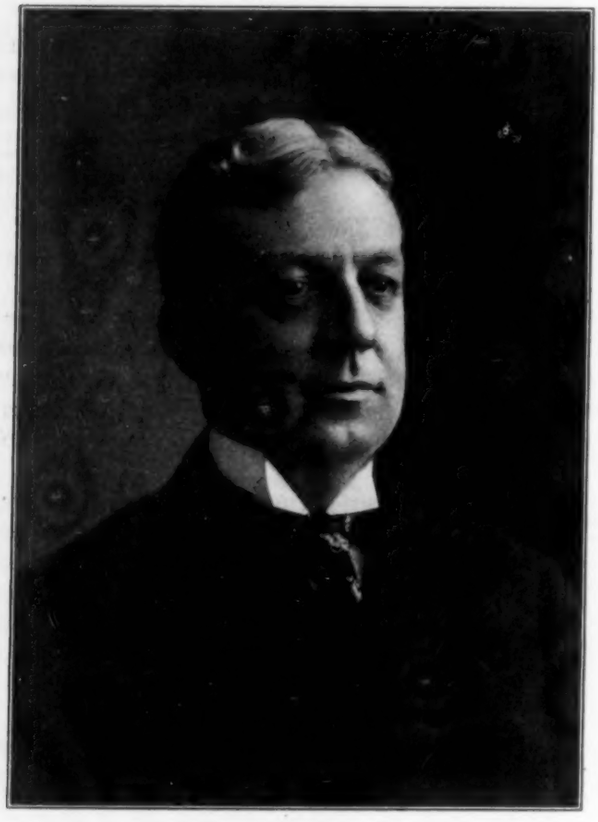
NEW OFFICERS

Elected by the Allis-Chalmers Co.—Henry Woodland the new Treasurer.

The following directors and officers of the Allis-Chalmers Co. were elected last Thursday, Sept. 7:

President, Walter H. Whiteside, of Milwaukee, to succeed Benjamin H. Warren, of New York; treasurer, Henry Woodland, of Milwaukee, Wis., in place of William J. Chalmers, of Chicago.

New Directors.—Edward D. Adams and Edmund C. Converse, of New York; Mark T. Cox, of East Orange, N. J.; Joseph S. Neave, of Cincinnati, O., and Edwin Reynolds, of Milwaukee Wis. They succeed Benj. H. Warren, Frank G. Bigelow, Edwin Reynolds and Messrs. Adams and Cox whose terms expired.



HENRY WOODLAND.

A biographical sketch of Mr. Whiteside was published in these columns last week. A telegram from Chicago to *The Iron Trade Review,* says:

Henry Woodland, the new treasurer of the Allis-Chalmers Co., has been with the company since its organization, being formerly the treasurer of the Gates Iron Co., at Chicago. He went west from Utica, N. Y., in the early eighties to act as western representative of the Utica Headlight Co., manufacturer of locomotive headlights. He continued with this firm and its successors until 1895, when he entered the employ of the Gates Iron Works, taking at first a minor position. His native ability soon made itself felt and he was shortly afterwards made treasurer of the company. Upon the organization of the Allis-Chalmers Co., he accepted the position of assistant controller, subsequently becoming assistant treasurer. Mr. Woodland has made but three changes during his entire business career, which in itself is a testimonial of his strength of character. After leaving school he became connected with the Wood & Mann Steam Engine Co., Utica, manufacturer of portable steam engines, where he continued until its failure, after which he entered the employ of the Utica Headlight Co. One of Mr. Woodland's strongest characteristics is his remarkable memory for names and figures, which has been of inestimable value to him as a credit man.

RAIL ORDERS

Include 80,000 Tons to the Pennsylvania and Other Large Contracts.

(Special Telegram.)

NEW YORK, Sept. 13.—Among the sales of rails for the week were the following: Missouri Pacific, 25,000; Chicago & St. Paul, 10,000; Harriman Lines, additional, 32,000; Wheeling & Lake Erie, 5,000; Pennsylvania, 80,000.

The Sloss-Sheffield Steel & Iron Co. yesterday declared a dividend of one and three-quarters, preferred, quarterly, two and one-half common, also decided to issue additional stock to holders.

OBITUARY.

Delos Dunton, vice president of the Star Mfg. Co., Carpentersville, Ill., died at his residence, Riverview Home, near Carpentersville, Tuesday morning, Sept. 5, after a lingering illness. He had been connected with the Star Mfg. Co. as stockholder and officer for many years, and was widely known throughout the trade.

Francis B. Butts, secretary and treasurer of the Madison Avenue Foundry Co., Cleveland, died Aug. 8 after a brief illness. Mr. Butts was born in Providence, R. I., in 1844. He served in both the army and navy in the civil war and located in Cleveland about four years ago. His widow and one daughter survive him.

William Dow Farrar, who for 30 years conducted an iron business in New York city, died in Great Barrington, Mass., Sept. 10, aged 60 years. Mr. Farrar was a captain during the civil war and companion of Kit Carson in many exploits with the Indians. He leaves a widow, formerly Miss Sarah Steele, of New York.

William Patterson, pioneer iron manufacturer of Newcastle, Pa., died at the age of 81, Aug. 30. In 1852 he began the mining of coal along the Mahoning river, near Lowellville, O., in which trade he continued until the time of his death. Mr. Patterson was also very largely instrumental in establishing various steel and iron companies in that district; among them are the Newcastle Wire Nail Co., the Neshannock Furnace Co., the Shenango Tin Plate Co., the Shenango Valley Steel Co., and others. With few exceptions the companies with which he was connected have now been absorbed by the steel corporation. Mr. Patterson was a broad minded and liberal man and was as prominent in his friendships as in his business.

Warrant Yard Stocks.

The statement of the stocks in the warrant yards of the American Pig Iron Storage Warrant Co., for August, as given below, show a decrease of stocks on hand during the month:

On hand July 31, 1905	93,400 tons
Received during August	1,900 tons
Total	95,300 tons
Delivered during August	8,500 tons
Total on hand Aug. 31, 1905	86,800 tons

BLAST FURNACE ACTIVITY INCREASES.

PRODUCTION FOR AUGUST 103,243 TONS MORE THAN JULY—

Stocks Show Little Change—Charcoal Furnace Report Published for the First Time

Prediction had placed the production of pig iron for August in the neighborhood of 1,700,000 tons. This estimate, as shown by the accompanying statement, was too conservative, as the actual reports from operating companies show a production of 1,568,171 tons, and an estimated production obtained from the unreported furnaces gives a total of 1,822,971 tons, which is close to the actual production. As indicated in Table I, the activity in the various states has increased uniformly, a tendency that has been expected, the activity in August being 6.5 percent greater than July, the increase in "tonnage make" being 103,243.

A number of furnaces resumed activity during the month in addition to which good records were made at some plants. The activity gives every evidence of being continued into September and is demanded by the need of iron and steel industries, which are consuming iron as fast as produced.

This month's statement, while it is apparently the same as ordinarily, necessitates some explanation. A glance at the number of unreported furnaces and the small stocks, together with the increased capacity not reporting, will explain wherein the report this month is less accurate than heretofore. When *The Iron Trade Review* first undertook the publication of these statistics it did so in response to what it felt was the wish of its readers, both consumers and producers. The response to our request to the producers for their co-operation in compiling this statement by sending in their reports was very generous, and abundantly warranted our undertaking, though there have been each month, as has been indicated in the report, some furnaces which have withheld their figures. Until this month the number of unreporting companies had been gradually diminishing, affording the prospect in the near future of an absolutely accurate statement. This month, however, a much larger number of furnace figures were withheld from publication in any report whatsoever, the information being withdrawn from all publishers alike. But inasmuch as *The Iron Trade Review* has sought to present a statement each month in which that part of the production which was estimated was clearly separated from the part obtained from actual returns, this explanation has been deemed necessary in this issue.

The stocks report, while it does not indicate so large a tonnage in August as in July, the figures being 429,267 tons, against 628,708 last month, in the light of the above explanation will make it apparent that in reality the stocks have moved very little either up or down. The "capacity not reporting" has increased about one-half and the stocks have decreased somewhat less than a half, which would indicate, if anything, a slight increase in stocks.

Furnace Activity

TABLE I.

State	No. of Stacks (1)	No. in Blast (2)	Capacity per mo. in Blast (3)	Percent of Total Capacity Produced Aug. (4)	July (5)
Pennsylvania	126	95	747,303	83.5	79.4
Ohio	48	36	323,610	75.5	71
Alabama	24	17	98,750	68.2	56.2
Illinois	21	19	175,000	81	83.4
Virginia	22	14	54,120	59.2	56.4
New York	17	13	105,000	77	69.5
New Jersey	10	8	32,500	67	55.2
Tennessee	15	10	31,850	60.6	52
Kentucky	6	2	6,000	31.8	32.8
West Virginia	4	3	20,000	36.8	20.1
Colorado	5	4	39,750	61.5	50.7
Wisconsin	5	3	17,235	63.4	69
Michigan	1	1	7,500	102.5	92.3
Minnesota	1	1	5,580	94.8	52.8
Missouri	1	...	...	...	...
Maryland	4	4	33,000	86.5	72.5
Georgia	1	...	...	...	...
North Carolina	1	...	...	...	...
Total	312	230	1,698,488	88.4	71
Unreported	58	...	412,000	...	...
Grand Total	370	...	2,110,488	88.2	75.7

Tonnage Report

TABLE II

State	Actual Make Steel Companies (1)	Actual Make Merchant Companies (2)	Total Aug. (3)	Total July (4)
Pennsylvania	648,064	95,441	743,505	745,989
Ohio	225,838	53,100	278,938	307,806
Alabama	18,256	65,167	81,423	126,837
Virginia	23,728	19,388	43,116	43,817
New York	38,425	56,538	94,963	91,577
New Jersey	.....	27,598	27,598	22,978
Tennessee	45,804	28,229	74,123	72,070
Kentucky		.....		
West Virginia		.....		
Maryland		.....		
Illinois	175,020	27,953	211,531	200,032
Colorado		.....		
Wisconsin		8,588		
Michigan	.....			
Minnesota	.....			
Missouri	.....	12,974	12,974	9,622
Georgia	.....			
North Carolina	.....			
Total	1,175,225	392,946	1,568,171	1,629,728
Unreported.				
Pennsylvania	64,000	45,000	110,000	81,500
Ohio	.....	73,800	73,800	2,500
Alabama	50,000	9,000	59,000	.....
Wisconsin	.....	.....	.....	3,000
New York	.....	5,000	5,000	.....
Tennessee	4,300	3,700	8,000	3,000
Unreported total	118,300	136,500	255,800	90,000
Grand total	1,293,525	529,446	1,822,971	1,719,728

Stocks Report

TABLE III.

State	Steel Co.'s. (1)	Merchant Furnaces. (2)	Capacity in blast not reporting Steel Co.'s. (3)	Capacity in blast not reporting Merchant Co.'s. (4)
Pennsylvania	81,290	71,183	641,563*	49,970*
Ohio	300	47,733	227,200	74,925*
Alabama	.....	98,054	37,000*	17,000*
Virginia	12,871	13,940	4,170	.....
New York	24,111	30,090	.....	6,000
New Jersey	.....	25,996	.....	.....
Tennessee	25,982	22,821	4,500	4,200
Kentucky		.....	.....	.....
West Virginia	.....	.....	7,000	.....
Maryland	.....	4,234	33,000	.....
Illinois	.....	.....	142,000	.....
Colorado	.....	.....	.....	.....
Wisconsin	.....	4,752	5,735	.....
Michigan	.....	.....	.....	.....
Minnesota	.....	.....	.....	.....
Missouri	.....	16,061	.....	.....
Georgia	.....	.....	.....	.....
North Carolina	.....	.....	.....	.....
Total. Aug.	94,393	334,874	1,102,828	152,095
Total. July	154,846	473,862	818,810	98,225
Aug. Grand Totals		429,267		1,254,923
July " "		628,708		857,035

*Estimates.

Charcoal Iron Production for August.

Reports from 40 charcoal furnaces having a capacity of 53,957 tons monthly, indicated a production of 24,257 tons in August. Eight furnaces, representing a capacity of 10,835 tons, failed to report. Stocks amount to 45,959 tons.

ALL DISCRIMINATION REMOVED.

AMERICAN MACHINERY WILL BE ADMITTED BY RUSSIAN GOVERNMENT.

Interviews Indicate Large Increase of Business as Result of Czar's Gracious Act.

(Staff Correspondence.)

NEW YORK, Sept. 11.—American manufacturers of machinery can now compete with those of the "most favored nations" in the trade of the Russian empire. At the reception to the Russian peace envoys at Oyster Bay last Saturday night M. Witte, by direction of the Czar, presented to President Roosevelt the following communication: "Some years ago, in consequence of a misunderstanding in the interpretation of the most favored nation clause, there were established in Russia on several articles of American production customs duties on a higher scale than those levied on the same articles when imported from other countries.

"His Majesty the Emperor of Russia has commanded me to inform the President of the United States that he has been pleased to order the discontinuance of the levying of such higher duties on American products in order that henceforth the American manufacturers should pay the same duties as importers from other countries."

The customs duties referred to by M. Witte in his communication grew out of the imposition in the early part of 1901 by this government of a differential duty on Russian sugar imported into the United States owing to a complaint made by American sugar producers that Russian producers were receiving a bounty from their government. Following this action of the United States was the issuance in retaliation of an order of the Russian minister of finance, which became effective March 9, 1901, imposing maximum duties on certain American articles, the increases ranging from 20 to 30 percent. Generally stated, these articles were cast iron wares, manufactures of iron and steel, iron and steel boilers, tanks, bridges, pipes, etc., machinery, sewing machines, meters, dynamos, portable engines, locomotives and locomotive cars, locomobiles and fire engines.

All the prominent machinery men in New York seen by representatives of *The Iron Trade Review* expressed great appreciation of the Russian emperor's action in removing the discriminating duty on American machinery. President Roosevelt is universally given the credit for bringing about this result of his efforts in behalf of peace and a better understanding among the nations. The following are a few of the remarks gathered in the offices in the machinery district:

W. L. Saunders, president of the Ingersoll-Rand Co.: "It is a great thing for American commerce and will be a valuable aid especially in the machinery trade. It means a reduction of from 20 to 30 percent in the duty upon our product, which is equivalent to four or five cents a pound. We are now placed in the 'most favored nation' class while under the provision just removed we were discriminated against. It is a direct result of the negotiations which brought about the end of the war and to the President is due the credit."

A member of a firm of manufacturers of conveyors and mining machinery who preferred to remain anonymous: "There will undoubtedly be great industrial activity now since the war is over. Russia must rehabilitate herself and it is to her interest to make the entrance of goods into the country as easy as possible. That is a lesson which Japan has taught, not to one nation but to all."

P. M. Brotherhood, of Manning, Maxwell & Moore Co.: "The outlook for machinery trade in the Far East is very favorable. It is not likely to come all in a rush now that the war is over, but it will come. People are now taking their time to adjust themselves to the new conditions. The trade has been very satisfactory, as it is in the local market. Foreign shipments have lately run more to heavy tools than to lighter products."

W. J. Clark, of the General Electric Co.: "Our trade in the Far East is good and it promises to be better. We have recently sold as many as 40 steam turbines in Japan, ranging from 70 to 2,000 h. p. Twenty-five are already in operation. There is bound to be a remarkable industrial development in the Mikado's empire. In many respects the labor conditions there are ideal. We are just now opening a plant for the manufacture of incandescent lamps near Tokio. Machinery has been on the ground for 30 days or more. The location offers many advantages for supplying the nearby countries. The Japanese are peculiarly fitted for work of that kind, and some of the materials—bulbs—are less expensive than even in Europe."

W. P. Pressinger, manager of the compressor department of the Chicago Pneumatic Tool Co.: "As soon as the Eastern nations get their financial affairs adjusted, America is bound to have its share in the business. But it will take some time to work out the financial tangle."

A manufacturer of mining machinery and conveyors: "The industrial and commercial development of the East in the near future is going to astonish the world. What Japan has done in war we may expect to see accomplished in other lines also. Whether the Western nations will profit enormously or not, however, depends entirely upon the attitude of Japan. She will henceforth be the determining factor and in every enterprise, whether commercial or industrial, she will have to be reckoned with. Her friendship is therefore of the utmost importance."

LATE PITTSBURG NEWS.

(Special Telegram.)

Pittsburg, Pa., Sept. 13.—Last night the Ohio furnace of the Carnegie Steel Co. was blown in. This is a small detached furnace and is only operated in times of great pressure. The Zanesville stack and the two Columbus stacks are to be blown in immediately, but the Columbus steel plant will not be started unless pressure for steel becomes very great.

The first lot of the Jones & Laughlin Steel Co.'s new steel cross-tie has been put down on its Monongahela connecting railway, where these ties will get a very severe test.

The Nicola Construction Co., Pittsburg, has just closed a contract to erect 500 houses at Lorain, O., for the Sheffield Land & Improvement Co., which will put them on the market.

New England Foundrymen's Association.—The New England Foundrymen's Association will resume its monthly meetings on Wednesday, Sept. 13, at the rooms of the Exchange Club, corner Milk and Batterymarch streets, Boston, at 5 p. m. Dinner will be served at 6 o'clock, after which the meeting will be addressed by Mr. E. H. Mumford, of Philadelphia, on "A New Multiple Molding Process." An open discussion will follow.

PERSONAL.

Joseph A. Rothwell has accepted the superintendency of the Pioneer Iron Works, Brooklyn, N. Y.

John W. Dougherty, assistant superintendent of the Pennsylvania Steel Co.'s Works at Steelton, Pa., is home from Europe.

J. M. Bashford has been appointed to take charge of the publicity department just established by the American Locomotive Co. He will begin work Oct. 1.

Leonard Peckitt, president of the Empire Iron & Steel Co. and the Sheffield Steel & Iron Co., Catasauqua, Pa., has just returned from Europe.

Charles J. Thompson, formerly representing the Hendrick Mfg. Co., Carbondale, Pa., at its New York office, 149 Broadway, has severed his connection with the company.

Mason D. Pratt, formerly at the head of street railway department of the Pennsylvania Steel Co., has been chosen to make plans for the new power house of the Harrisburg traction companies.

Richard Peters Jr., who has been secretary and treasurer of the Solid Steel Casting Co., Chester, Pa., for about four years, has become associated with the Georgia Iron & Coal Co. at its Rising Fawn furnace, Rising Fawn, Ga.

E. G. Toot has been elected vice president and general manager of the Gunnell Machine Co., Manitowoc, Wis. Mr. Toot was formerly with the American Shipbuilding Co., at Chicago.

G. C. Shade, vice president and general manager of the Braddock Machine & Mfg. Co., Braddock, Pa., has severed his connection as an official of that company. He does not intend to engage actively in business in the near future.

J. J. Casey, who for the past nine years has been superintendent of the Haskell & Barker Car Works at Michigan City, Ind., has accepted a position as superintendent of the Jeffersonville plant of the American Car & Foundry Co.

O. J. Ziegler, of Freeport, Ill., has sold his interest in the Stover Manufacturing Co., of that city, to D. C. Stover, and will go to Denver to reside. This gives Mr. Stover entire control of the company.

Ira B. Bassett, Cleveland; George A. Baird, Chicago, and J. C. Owsley, Sharon, Pa., executors of the estate of Peter L. Kimberly, started this week on a trip to California on business connected with that estate.

H. F. Stratton, who has been connected with the principal office of the Electrical Controller & Supply Co., at Cleveland, has accepted the position of New York representative of the same company, with offices at No. 136 Liberty street, New York city.

Samuel McDonald has resigned as superintendent of the steel plant of the Tennessee Coal, Iron & Railroad Co., at Ensley, Ala. His resignation will take effect Oct. 1, and C. A. Durfee, for some time past connected with the Colorado Fuel & Iron Co., will be his successor.

C. W. Sherman, of Pittsburg, has accepted a position as superintendent of the Pratt & Letchworth Co. plant, Buffalo, to go into effect on the first of October. Mr. Sherman is a recognized metallurgist and has had wide experience in managing large plants.

Frank Bull, president J. I. Case Threshing Machinery Co., Racine, Wis., was seriously injured Sept. 5 by an explosion in his garage. Mr. Bull and his automobile were hurled to the ceiling, his head and face being badly cut. The automobile was wrecked.

Ernest L. Cronemeyer, superintendent of the National works of the American Sheet & Tin Plate Co., Monessen, Pa., has resigned to accept the general managership of the Humbert Works, at South Connellsville, Pa. Mr. Cronemeyer will be succeeded by U. S. Smiley.

During the absence of I. H. Pratt, who is now in Europe, J. A. Murray, formerly with the Peckham Mfg. Co., Kingston, N. Y., will act as Eastern manager for the Ajax Mfg. Co. He will be located at the office of Mr. Pratt, 149 Broadway, New York.

H. F. J. Porter, M. E., has opened an office in the Metropolitan building, 1 Madison avenue, New York, as consulting engineer. His especial field will be to give advice on general manufacturing and mechanical engineering questions tending towards industrial betterment and to install "welfare work."

Clarence Lowenstein has retired from the firm of Theodore Geissman & Co., 115 Dearborn street, Chicago, direct mill representatives in the sale of iron and steel and wire products, of which he was a partner. His interests were assumed by Mr. Geissmann, who will conduct the business on his own account at the same address and under the same firm name.

Among the distinguished guests who accepted invitations to Col. George Harvey's dinner at the Metropolitan Club in honor of M. Witte and Baron Rosen were the following men prominent in the iron and steel world: J. Pierpont Morgan, George W. Perkins, Charles B. Flint, William E. Corey, George Westinghouse, ex-Judge E. H. Gary and H. H. Rogers.

Edwin R. Kent, president Edwin R. Kent & Co., 10 South Canal street, Chicago, tool steel manufacturers, has returned from a six months' vacation spent in Europe. Mr. Kent went abroad for his health and spent the greater part of his time at Carlsbad, Germany, although he visited several places in England and France.

Frederick W. Williams, master mechanic of the Lackawanna railroad, has resigned and will on Sept. 15 become connected with the Leslie Co., of Lyndhurst, N. J., in the capacity of superintendent of manufacturers of railroad and marine supplies. Last week the employes of the shops of East Buffalo presented Mr. Williams with a handsome diamond ring as a token of esteem. The popular master mechanic entered the employ of the Lackawanna railroad in April, 1898, as general foreman of the Scranton shops. Since then he has been master mechanic of the Utica and Syracuse sections, and after July, 1900, chief, with headquarters at the East Buffalo shops. He is first vice president of the Central Railway Club.

Victory for Roebling Sons Co.—The suit of the John Roebling Sons Co. against the city of New York was decided on Sept. 7 in favor of the plaintiff. Ex-Judge Alton B. Parker, who was appointed by the Supreme Court to take testimony in the case, filed a report which, when it is confirmed, will call upon the city authorities to pay to the bridge builders $231,621.69, the balance due for work done in the construction of the Williamsburg bridge. The city will also be compelled to pay interest and costs. The bridge commissioners withheld part of the contract price, claiming the right to deduct $175,000 from the total amount for failure to complete the work in the specified time. The referee finds that the city authorities were responsible for the delay, and that in any case the bridge was not opened until long after it had been completed.

The Beattie Machine Works, Cohoes, N. Y., appears among the incorporations of last week. The purpose is to manufacture motors, engines and machinery, and the capital $10,000. The incorporators are: William, Ellen, Grace M., Walter J. and Blanche M. Beattie, all of Cohoes, New York.

PRONOUNCED PROSPERITY

Among the Machine Tool Manufacturers at Cincinnati—New Companies.

CINCINNATI, Sept. 5.—Evidences of activity and prosperity are everywhere apparent in the machine tool manufacturing district. It has the look of another boom period. Lights in several of the large plants can be seen at night showing that the concerns have booked orders which compel overtime operation. The foreign trade is developing to proportions beyond expectations, and with a heavy domestic call for machine tools the demand is sufficient to test the full capacity of many concerns. It is not to be inferred that all of the plants are taxed to their limits of productive capacity, but there are no complaints, and those concerns that have felt the usual summer quietude in point of new business, have had enough business on hand to keep them going, and August has been a good month in point of shipments. Some manufacturers report satisfaction in being able to make up some stock, and complete their lines, realizing the advantage of being able to deliver promptly.

As is usual under conditions of activity new construction, installation of new tools and new engines of increased power, increasing of capital stock for the purpose of larger operations are to be observed.

The Fosdick Machine Tool Co. recently increased its capital stock from $60,000 to $100,000, the additional money to be used in extending the business.

The Cincinnati Electrical Tool Co. reports that its new building, on Evans street, near Eighth, is almost ready for occupancy. The new factory is a two-story structure. This concern is one of the comparatively new manufacturing enterprises. Its special lines are meeting with a good demand.

The Lodge & Shipley Machine Tool Co. has purchased a new Greenwald engine, which is to be installed in the near future. This is another evidence of increased capacity and the necessity for additional driving power for the plant.

The Cincinnati Machine Tool Co. has recently installed a large grinding machine and is now grinding all the principal parts of its drills, even the large columns on which the table arm operates. This process makes the machine more accurate in construction than can be accomplished by hand filing. It is stated that experts, who have visited the shop, and have had this method shown them, have been much pleased with the demonstrated results. This is believed to be something new, and the company is much pleased with smoothness and high finish obtained by the use of the grinding machine.

The Houston, Stanwood & Gamble Co. was incorporated at Columbus Sept. 1, with a capital of $400,000. The company formerly had a capital of $150,000, and is engaged in the manufacture of engines and boilers, with a plant in Covington. The plant will be enlarged and the business extended. The new capital will be equally divided into common and preferred stock, the latter bearing 6 percent interest. The incorporators are Charles R. Houston, James B. Stanwood, Edward Goepper and C. F. Houston. James N. Gamble is a big stockholder.

A group of Cincinnati men, headed by J. H. Schneider, is negotiating for a piece of property in Norwood on which will be erected an automobile factory for the building of touring cars and heavy automobile delivery wagons.

Negotiations are under way for the sale of an interest in the Cincinnati Punch & Shear Co. to R. J. Venner, of Cleveland, O. Mr. Venner is a practical man, and it is expected he will go into the company as general manager.

PHILADELPHIA FOUNDRYMEN'S ASSOCIATION.

The 149th meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, on Wednesday, Sept. 6, with about thirty members and visitors in attendance. The meeting was called to order at 8:45 p. m. by W. I. Haldeman, in the absence of the president and vice president.

The secretary presented the report of the treasurer showing a balance of $2,050.90. After due acceptance of this report the chairman called upon Mr. Jos. I. Dinkelspiel, of the Partamol company, New York city, who read a paper on "Partamol."

During the course of his remarks Mr. Dinkelspiel explained the use of this new substance as a perfect parting for molds of any size castings made of iron, brass, bronze, aluminum, etc., and cited cases where partamol is most economically used as a substitute for lycopodium. "Dusted lightly," it acts as a perfect separator, preventing the sand sticking to the pattern and consequently producing a sharp, clean and perfect mold. It permits the mold to absorb the water thoroughly, standing proper swabbing without the water running.

In the brief discussion which followed the reading of the paper, Mr. Dinkelspiel was asked if partamol could be used for stove work, such as nickel trimmings and edges or other parts cast out of fancy metal. He replied that he thought it could be used with a great deal of satisfaction, and that it is very much better than any parting sand to be obtained, besides being more economical. Where a man puts up a great many molds in a day, partamol pays for itself many times over, and for ornamental iron work "it cannot be beaten."

After a vote of thanks had been extended to Mr. Dinkelspiel for his presentation of the subject, the meeting adjourned for buffet lunch which was served on the roof garden of the Manufacturer's Club.

Those in Attendance.

W. I. Haldeman, Pulaski Iron Co., Philadelphia.
W. G. Parsons, Bement, Miles & Co., Philadelphia.
H. E. Pierce, Girard Iron Works, Philadelphia.
A. G. Wigham, Pneumatic Casting Co., Philadelphia.
H. G. Mitchell, Rogers, Brown & Co., Philadelphia.
S. S. Reckerfus, *Iron Age*, Philadelphia.
A. A. Miller, *Iron Age*, Philadelphia.
Walter McDonald, Schaun & Uhlinger, Philadelphia.
Harry Huder, Schaun & Uhlinger, Philadelphia.
C. Gorman, Schaun & Uhlinger, Philadelphia.
T. B. Harkins, Harkins Foundry Co., Bristol, Pa.
Luther Shick, Thomas, Roberts, Stevenson Co., Philadelphia.
W. O. Steele, Bateman Mfg. Co., Grenloch, N. J.
W. A. Perrine, Abram Cox Stove Co., Philadelphia.
John Fleming, S. I. Creswell Iron Works, Philadelphia.
C. D. Matthews, Camden Iron Works, Camden, N. J.
H. O. Evans, Thos. Devlin Mfg. Co., Philadelphia.
Jas. S. Stirling, S. I. Moore & Sons Co., Elizabethport, N. J.
Fredk. W. Myers, *The Iron Trade Review*, Philadelphia.
Jos. I. Dinkelspiel, The Partamol Co., New York.
J. Thompson, J. Thompson & Co., Philadelphia.
Adam Pugh, I. A. Sheppard & Co., Philadelphia.
Hy. Creamer, Adams Foundry Co., Philadelphia.
Howard Evans, J. W. Paxson Co., Philadelphia.
Geo. C. Davis, Chemist, Philadelphia.
T. J. Kelly, Philadelphia.

Pittsburg Foundrymen's Association.—The first meeting of the Pittsburg Foundrymen's Association after the summer vacation was held Monday evening, September 11, at the regular meeting place, 410 Penn avenue, Pittsburg. Papers were read by W. S. Quigley and H. D. Harvey on "Brass and Metal Melting Furnaces," and by A. W. Slocum, on "Recommended Specifications for Cast Iron."

The injunction suit involving the Pennsylvania Steel Co. and the Manhattan bridge contract has not yet been dissolved. The defense had a hearing Sept. 6. The other side will be heard Sept. 13, and lawyers will hand in briefs Sept. 16.

THE CLEANING AND AGGLOMERATING OF ORE DUST.

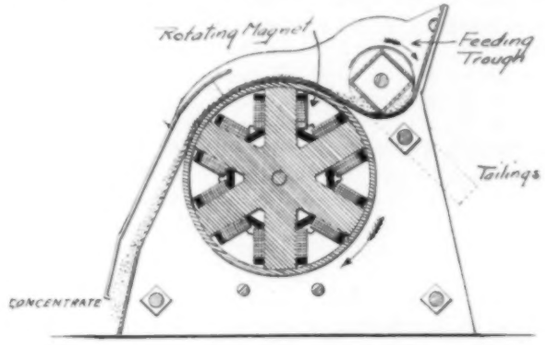
SEPARATION OF IMPURITIES FROM FINE ORES BY MAGNETIC ACTION.

Concentration of Ore Dust for the Blast Furnace by Electric Process.

Just east of the power house on Buffalo avenue, Niagara Falls, N. Y., a process of apparently great value both to producers and consumers of magnetite ores is being developed, and at the time of the visit of a representative of *The Iron Trade Review* was about at the point of operating perfection. As is well known magnetic ores are magnetically cleaned or concentrated by means of a variety of patented devices with a greater or less degree of thoroughness. The first part of this new process which extends back a number of years, is concerned with the separation of impurities from the ores.

As a natural sequence, the man who studied these ores, many of which are in the "dust" condition, for cleaning, knowing that the ore-producer must accept a lower price on account of the presence of the dust in the ore and realizing the difficulties and cost of handling finely divided material in the furnace, was led to devise a method for converting the dust into a condition suitable for use. The second step in the process has to do with a treatment of the ore-dust with that end in view.

The third step is the result of ideas that have suggested themselves during the erection of apparatus to handle the



SECTION THROUGH RUTHENBURG SEPARATOR.

previously determined plans and provides for the reduction of the ore to spongy or wrought iron. The iron in this condition may be treated by any of the ordinary methods, to produce whatever steel may be desired, which part of the work does not belong essentially to the process to be described in this article. For experimental purposes an electric furnace has been constructed at this plant in which the spongy iron is melted to receive the various steel making ingredients, simply to avoid the construction of an ordinary open hearth or other furnace which would be very expensive.

The inventor of the process is Marcus Ruthenburg, one who has for some years been connected with the iron and steel industry in New York and Pennsylvania. Mr. Ruthenburg has held patents on the magnetic separator, which is being used at the Ruthenburg Reduction Co.'s plant at Niagara for some years but the present developments had their beginning in some casual experiments at Steelton a few years ago. Finding at one time while working independently at Steelton that some ore he had accidentally obtained from the Cornwall mines was magnetite instead of a poor hematite as he had been told, Mr. Ruthenburg proceeded to wash, clean by the use of his separator, and analyze the specimen. He obtained in the end, two valuable results from what had been considered very poor ore. Of one part, the iron content had been raised and the impurities reduced by his concentrator to a sufficient extent to make it a valuable iron ore and the remainder proved to be worth working for its copper. On the strength of the following analyses, which he submitted to the mine owners, a 200-ton plant was built at Steelton, and Mr. Ruthenburg retained to operate it. This plant is now being replaced by one of 1,000 tons.

Analyses of Cornwall Ores.

Raw Cornwall.		Iron Concentrates.	Copper Concentrates		Waste Tails.		
Iron	40 96 %	67.71	27.86		10.43	Raw Ore	100 %
Silica	19 97	3 86	27.00		43.17	Iron conc.	68 %
Sulphur	1.93	0.12	11 45	Alumina	15.00	Copper "	12 %
Phos.	0.023	0.010	——	Lime	6.90	Waste	20 %
Copper	0 64	0 018	8.65	Magnesia	11.50		

The Ruthenburg Reduction Co., with Mr. Ruthenburg as manager, is the outcome of that successful beginning and since the installation of this plant a uniform ability to improve a large variety of magnetite ores to an unusual degree as shown by a series of analyses has led the company to go into the market boldly not only for all dust that will go through a 20-mesh sieve, but also for poor ores, which when crushed and treated in the same manner as the dust, are made worth handling. The following are analyses of some ores which have been treated by the Ruthenburg method:

St. Lawrence Beach Sands.

	Iron.	Silica.	Sulphur.	Phosphorus.	Titanium.
No. 1	71.07%	0.51%	0.012%	0.013%	1.30%
No. 2	68.05%	0.57%	0.010%	0.011%	4.20%
No. 3	70.16%	0.42%	0.017%	0.034%	1.15%
No. 4	70.20%	0.42%	0.011%	0.032%	1.05%

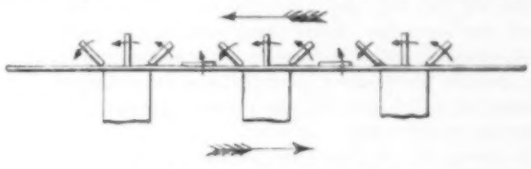
Lake Superior North Shore Sands.

	Iron.	Silica.	Sulphur.	Phosphorus.	Titanium.
Concentrates as received..	64.01	4.15	0.025	0.029	5.50
Cleaned by R. Machine.....	66.6	2.00	0.015	0.010	0.76

Port Henry Concentrates.

	Iron.	Silica.	Sulphur.	Phorphorus.
As received	66.67	2.56	....	0.701
As cleaned	71.00	.66	....	0.055

The separator, a cross section of which is shown, consists of a revolving magnet similar in construction and winding to an alternating current drum armature. There are six poles, and the whole thing rotates, being driven by a motor, inside of a brass cylinder open at both ends. The magnetizing current, which is direct, is fed into the magnet coils through two collector rings on end and when magnetism is set up and the



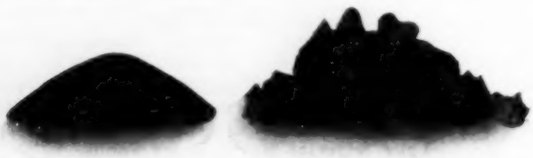
MAGNETIC ACTION ON ORE DUST.

motor statrted the equivalent of a traveling field, acting through the enveloping cylinder is obtained. Running longitudinally with the cylinder, is a trough in which a helical screw is operated and into which the ore dust is fed. The scroll simply serves to work the dirt, or "tailings," all of which slides back into the trough toward one end, where there is an outlet.

The action of the magnetic field on the ore in cleaning it is illustrated in the accompanying sketch and may be explained as follows. Looking toward the separator from the driving end, as in the view above, the other end being the collector ring end, the feeding trough is on the right side of the cylinder and the magnet is revolving in a clockwise direction. The trough is solid with the cylinder and its

outline with that of the cylinder is a simple compound curve affording a continuous surface which the ore particles can ascend in response to the pull of the magnet. As one pole approaches the nearest ore in the trough the ore particles or "heads" stand on end and as the pole passes, they incline toward the next approaching pole, following the lines of force, fall flat midway and again are erect on their opposite end, radially from the next pole. The continuation of this, simply results in the dust walking end over end up the inclined circumference of the cylinder in the opposite direction to the rotation of the magnet until they drop over as cleaned "heads" on the receiving side. The impurities which are non-magnetic, are effectually separated in this way. Of course where some of the impurities are middlings, that is, partially magnetic, this method fails as do all others. To illustrate the exceptional thoroughness of the apparatus: the writer watched a sample of a concentrated ore, which is on the market as a cleaned product, treated with the result that fully five percent of the ore used was returned by the separator as siliceous and other impurities. The separator permits of being made of any size and the manner of its operating does not necessitate running at a low speed to be efficient.

The company is in the market for dust up to that which will pass a No. 20 mesh, but the best results are obtained, especially in the elimination of phosphorus impurities, from fire dust. Thus in a single stroke we have one of the most costly,



CONCENTRATES BEFORE AND AFTER AGGLOMERATION.

most difficult to clean of impurities and the most troublesome form of ore, provided for. An analysis of ore, in which especially successful results in eliminating phosphorus were obtained, follows:

Salisbury Steel & Iron Co.

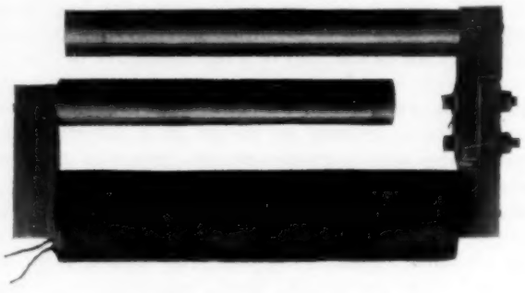
Raw Ore	44.80	15.56	0.076	.947
Concentrates	67.27	2.60	0.060	.019
Tails	4.53	71.80	0.090	2.379

The next operation is to prepare this concentrated dust for the blast furnace. Many attempts have been made to combat the disadvantages which arise from the powdered condition of the ore and the consequent flue dust. Beside the one now being developed Mr. Ruthenburg himself has patents on almost every conceivable method for handling finely divided ore, patents which cover a wide range of processes and the holding of which protects the present method of agglomerating the concentrates.

To bring the ore dust into condition for practical use in the blast furnace it must be converted into a shape which will permit the gases of the furnace to percolate through the charge and so must be of some size and weight. The product of the Ruthenburg process is in the form of bean-like particles, and constitutes an admirable form for use in the ironmaker. The contrast in the physical structure of the concentrates before and after agglomeration is shown by the accompanying reproduction from a photograph of an equal weight of concentrates through a 20-mesh sieve and the Ruthenburg product.

To convert the concentrated dust, a tower which is similar in appearance to a blast furnace cut off above the tuyeres, has been erected and also constructed to provide for the reduction of the ore at the same time, which is the third step in Mr. Ruthenburg's scheme. The tower, a sectional view of which, together with the gas producer for reducing the ore, is shown, is about 30 ft. high and about 13 ft. in diameter at the base, and built of brick. In the interior is an inner tower, between the outside wall and which is an annular space, the purpose of which will be shown later.

On top, over the mouth of the tower, is placed an electric furnace of Mr. Ruthenburg's design and similar to the one shown in the accompanying cut. The only inlet for charg-

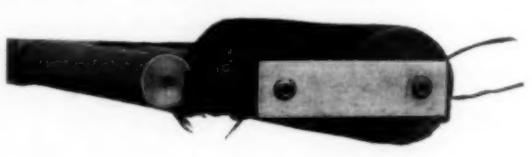


THE RUTHENBURG ELECTRIC MELTER.

ing the dust into the tower is between the arms of the furnace, which are electrically insulated from each other and form the terminals of a heavy melting circuit.

Current is supplied to the coils, and the two arms between which the ore dust must pass into the tower are strongly magnetized. The dust is raised on an elevator which stands at one side of the tower and fed directly on the two magnetic arms of the furnace, assuming a condition as shown.

The resistance to the passage of the melting current, set up by the finely divided particles of ore, which form a magnetic bridge and an electrical resistance, heats them to the point of fusion, and melted globules and masses of the ore drop to the bottom of the tower in a small and fairly uniform size, which regularity is contributed to by the falling of the molten particles through the distance from the top of the tower to the level of the charge. This melting is continued at the rate of about 2,000 lb. per hour, using 165 K. W. in that time, which means for the rate at which electric power is supplied at Niagara, a cost of about 50 cents per ton. The tower is filled up and then the process of reduction begins, the feeding of dust and the drawing off of reduced metal sponge being continuous. In an adjoining room, a hermetically sealed steel gas producer has been erected for making producer gas. The object in hermetically sealing is to enable the gas pressure, necessary to force gas through the material in the tower, to be obtained by sending air into the producer under pressure. To obtain a pressure of five pounds which is the blast used, the company has installed a Connersville air blower driven by a three-phase alternating current motor. The charge of coke is admitted through a device at the top consisting of a rotating barrel with two slots



THE FURNACE MAGNETIZED.

less than 180 degrees apart. The charge is placed in the barrel which is then rotated, the charge falling into the producer as the second valve opens downward, the charging valve then being closed so that no gas escapes. The ashes are taken care of by fluxing with blast furnace slag. Gas containing over 32 percent of carbon monoxide with less than one-half of one percent of dioxide as has been regularly produced. The hot gas under pressure passes through the main containing a sand valve into the bottom of the agglom-

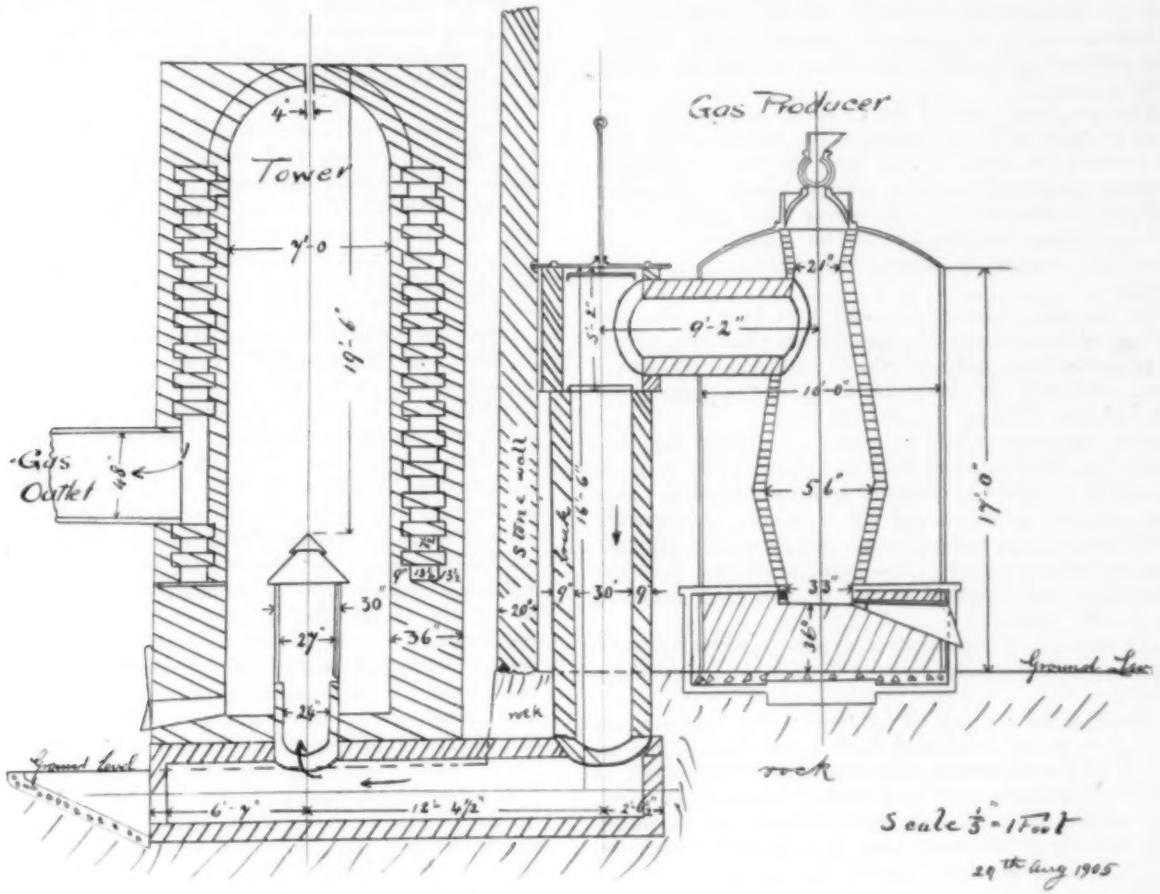
erating tower where it forces its way up through the ore. In the absence of the air the ore is reduced by the gas which in turn is converted in part into carbon dioxide and on reaching the top burns in contact with air and is diverted downward into the annular space surrounding the inner tower thus aiding in maintaining the heat of the ore. The gas is exhausted near the bottom of the tower into the open air through a chimney. From the time that any given part of the ore is charged into the tower until it reaches the bottom and is ready to be drawn out as wrought iron through ports provided, about 24 hours elapse. The sulphur in the ore is eliminated in the furnace during the fusion of the dust when the following reaction takes place: $2Fe_3O_4 + 4FeS = 5Fe_2 + 4SO_2$. Concentrates with as much as 0.8 percent of sulphur give an agglomerated product with 0.03 percent sulphur.

ability to show that money can be saved by its adoption. The following statement is a partial evidence of the extent to which the value of the ore is increased. Concentrates averaging 0.7 percent phosphorus and low in sulphur with 65 percent of iron, sell for about $3 a ton at the mine.

Concentrates averaging 0.5 percent sulphur but low in phosphorus sell for about $2.50 a ton at the mine, or in each case from four to five cents a unit for the contained iron.

Concentrates both low in phosphorus and sulphur cost about $4.50 at the mine, with 62 to 64 percent of iron or seven cents a unit.

The evident margin for the cost of working is the difference in the value of a high sulphur, high phosphorus, fine, dusty ore and a low phosphorus, low sulphur, lump ore. In the case of all these ores there is a goodly percentage of the



AGGLOMERATING TOWER AND GAS PRODUCER.

The SO_2 gas can be readily seen coming from the furnace at the top of the tower, and as there is no sulphur in the producer gas the iron taken from the bottom of the tower is practically free from that impurity.

The electric furnace in which the company has made some steel consists of a U-shaped trough, so constructed as to avoid inductance, with an electrode at each end of the trough. The trough is packed with the spongy iron and heated to whatever temperature is desired, depending upon the melting point of the ingredients to be added. With the exception of the carbon, which is supplied by laying charcoal on the iron in the furnace, the constituents to be put in the steel are added in the ladle. The furnace is built to carry about 8,000 amperes.

A necessary essential to the success of the process is its

concentrates that will pass a 20-mesh sieve and which the blast furnace regards as dust. The increased value of a lump ore over a fine ore of the same analysis is about $1 per ton. With the improved analysis after treatment there is also the advantage of a higher iron content which is worth a definite amount per unit, more than the low. An ore with 70 percent of iron (other things being equal) is worth 13 percent more per unit than an ore with 65 percent. On the basis of 50 cents per ton for agglomeration, with the cost of concentrating and reducing the ore at a minimum, the economy of the process is obvious.

The present building occupied by the Ruthenberg Reduction Co. is simply temporary and the company is looking forward to the erection of a $2,000,000 plant in the near future.

OIL FURNACES.*

BY JOHN McMALLY.

The subject of burning oil, from a theoretical point of view is a very large one and one not perfectly solved by our best chemists. The practical side of the question, however, particularly as it applies to the railroad smithshop, has received a vast amount of attention during the past few years, and today oil can be installed in any shop and for any class of work with a certainty of simplifying the heating facilities, greatly increasing the output and decreasing the costs accordingly.

At present a very large percentage of railroad work is machine blacksmithing and it is absolutely necessary to supply the various machines with raw material, properly heated, and in large enough quantites to work them to their full capacities. These machines cost the railroad a large amount of money, and if not turning out finished material in quantities approximating their capacities, are expensive investments.

When the larger part of the blacksmith's output was the result of hand labor, the heating of the material was a simple question, the quality of heat being the only consideration necessary, as any of the coal or coke fires could easily supply sufficient working material. In looking for a method of increasing heating facilities for machine work, petroleum, so bountifully supplied by nature, was naturally a great attraction.

The important points to consider have been quality and quantity of heat possible of production, cost and best method of producing same, and what should be, but has not always been, considered, the conditions to which the furnace-men are subjected handling the material.

Crude petroleum or fuel oil, which is commonly used, has a very high heating value containing from 20,000 to 22,000 heat units per pound as compared with from 12,000 to 14,000 heat units per pound of coal. It is capable of practically perfect combustion, leaving no ash and when properly handled, producing no smoke. The quality of the heat is as satisfactory as that furnished by coal or coke, if generated in the proper manner.

The mere act of burning oil is a simple one, but the burning of oil and producing a proper flame is a very particular process.

Atomizing the oil with air or steam under high pressure through variously constructed burners and burning the resulting mixture, depending upon the heat of the furnace to keep up the combustion, is a method commonly followed. This process necessitates forcing unconsumed oil, no matter how thoroughly atomized, into the furnace. Combustion does not begin until this part of the operation has been performed, and the atomized oil has been spread over the heating area and surfaces of the furnace. More or less of it, before burning, comes in contact with the material being heated, not only carbonizing there, showing imperfect combustion, but also having a cooling effect upon the material in the furnace, necessitating a longer period to properly heat the iron. Again, this high pressure or atomizer system almost invariably produces an oxidizing flame, resulting in the burning of the material. Bridge walls and other arrangements, somewhat help the combustion but do not overcome the oxidizing flame. Owing to our familiarity with compressed air, due to its general use in shops, few of us appreciate the high cost of producing it and its influence in increasing the cost of heating where used as an atomizing agent in oil furnaces.

These several objections to the atomizer system were appreciated back in the early 90's by a brother railroad man, and to his thorough study of the subject and his years of experimental work we are indebted for ideas which have been developed into the low pressure and economical process known by his name today.

He eliminated the expensive compressed air and substituted the ordinary low pressure fan blast used in open forges, on the theory that volume and not pressure was necessary for the successful burning of oil. With a pressure of only a few ounces, he fortunately could not successfully atomize the oil, so was obliged to work on other lines, resulting in a process which first burned the oil in a small amount of air, thereby breaking it up into the hydro-carbons, such as marsh gas, carbon monoxide, free hydrogen, etc., and finally supplying these gases with a second and larger volume of air burning them completely. All of this was done in a small and independent combustion chamber, the hot gases only being forced into the heating area of the furnace. This process resulted in a very perfect combustion of the oil, with a low cost of operation, and supplied a soft, dry heat to the furnaces.

Very thorough and extensive tests made on this process by Prof. Kenosche at the Iowa State College during the past winter demonstrated a combustion practically perfect before entering the heating area of the furnace, a temperature above 3,000 degrees at the same point, and the important fact that practically no oxygen was unconsumed, resulting in a reducing flame which should not injure the material being heated.

Other low pressure processes, discharging a mixture of oil and air into a combustion chamber or furnace direct are an improvement on the high pressure system, but do not as completely burn the oil, owing to the difficulty of supplying a sufficient quantity of oxygen at a single point, and result in a damp oxidizing flame. The process in use at the Northwestern shops overcomes this difficulty by means of the secondary air supply. Having perfected the combustion, insuring a maximum amount of heat from the least bulk of oil, the furnace design and construction to insure the saving and using of this heat, is equally important. The percentage of loss due to radiation is often high, but with a proper construction of the furnace can be made a small item. With perfect combustion, stacks are not necessary and a great loss of heat can be prevented by not using them. Radiation is a source of loss which should be overcome, and when this is done conditions for the man to work under will be more satisfactory and his efficiency increased.

A pound of oil contains a given amount of heat, all of which is made available with perfect combustion, but a poorly designed and constructed furnace, even if it is apparently doing satisfactory work, may be losing enough of this heat to make the cost of the operation prohibitive.

Comparative costs of coal and coke fuels depend upon locality. With properly constructed and operated oil furnaces the fuel bill can be much higher than coal or coke would be in the same furnace and still the cost of the work produced be materially lower. This is due to the greatly increased output, the greater intensity of the heat, the elimination of tending fires, the short time required to bring oil furnaces to the desired working temperature and the improved conditions under which the furnacemen work.

The maintaining of an even heat of any desired temperature is assured with an oil furnace. The quality of work is of a higher grade. The quantity of material turned out is greatly increased.

All of these results make better looking costs sheets, the key note to a successfully operated shop.

Discussion.—Mr. George Jordan.

Mr. George Jordan, who was a member of the committee to

*A paper presented at the Convention of the Railway Master Blacksmiths' Association, Cleveland, Aug. 15-17, 1905.

which the subject of "Oil Furnaces" had been assigned, submitted the following:

Having built a great many oil furnaces on our system (Texas and New Orleans), and having had much experience in their operation in our own shops and observed their working in other shops, I am convinced that oil furnaces must be built in accordance with the class of work for which they are to be used. We have ten oil furnaces running in our shop at Houston, Tex. We are only seventeen miles from the Humble oil fields, and oil is very cheap, while coal is expensive, so that we do all the blacksmithing we possibly can in oil furnaces.

What I believe to be the most important point in constructing an oil furnace so that it will work properly is to have sufficient air or fan blast to cause the proper combustion in the furnace. In order to do this you must have not less than eight ounces of fan blast, or from 60 to 75 lb. of air pressure, to cut your oil and spray it properly into the furnace.

The construction of the burner also forms a very important item in the successful operation of an oil furnace. We have many kinds of burners in the different furnaces in our shops, such as steam, compressed air and fan blast burners. We use only air and fan blast in the blacksmith shop, as we believe them to be the best. Steam burners were tried, but they did not work well on account of the water in the steam, which prevented a good welding heat on the iron. We have one large scrap or axle furnace in which we heat 10-in .driving axles. It is operated with 10-ounce fan blast, three burners at one end, and a stack at other end, and has two doors. The burners are made of 3-in. gas pipe with ⅜-in. oil pipe in the center. In constructing pipe burners, the oil pipe should be in the blast pipe and 1½ in. from the end of it. It should be protected by about two inches of extra fire brick inside the furnace. Without this arrangement great difficulty will be experienced in keeping the oil pipe clear of the severe heat with which it comes in contact inside the furnace.

There should be a combustion chamber on every scrap furnace, or a firebox about three ft. wide with a bridge extending well over the burners, so that the oil will have no possible chance to come in contact with the piles of scrap or slabs in the furnace. If the oil does come in contact with the slabs, there will be black seams or streaks in the forging, and when it is planed or turned up, the forging will be condemned. This, of course, makes no difference in any but a welding furnace.

A bolt furnace should have a water front and a continuous stream of cold water running into the bottom of the water front, the hot water running out through a waste pipe at the top. In this way the heat in front of the furnace will be diminished, which makes it much more comfortable for a man who is heating iron. A bolt furnace should have two burners, one at each end, so that in case one burner is out of order, the other can be used. In all cases blast should be used in both burners and oil in only one; otherwise the burner, which is not working, will be damaged or ruined by the excessive heat. We use from 40 to 50 gallons of fuel oil in ten hours on one of these bolt furnaces.

A spring furnace should have a combustion chamber, or firebox, and a stack to carry off the gases arising from the oil, so the spring maker can stand close to the door at all times with comparative comfort, in order to gauge the oil to keep the furnace at the same degree of heat and prevent overheating the steel. Our spring furnace has two burners at one end and a stack at the other. It has firebrick floor and is large enough to heat the longest spring leaves.

The construction of a flue furnace differs materially from any other, on account of the short heat taken in welding the scarf end on the flue. A flue furnace should have a combustion chamber, and from it should lead a narrow passageway (say about four in. square) to the point where the flame comes in contact with the flue. After it passes the flue there should be a stack to draw off the blaze and prevent its coming out at the opening where the flue is heated. If there is no stack on the flue furnace too long a heat will be had on the flue, and it will be almost impossible for the flue welder to stand by his machine, on account of the intense heat and the gases arising from the oil. With the old coke furnace, 200 flues was a good day's work, while with one of these oil furnaces 400 flues can be welded in ten hours with ease.

In regard to the kind of furnace best adapted for a bulldozer for heating arch bars, and all other work that needs forming or bending, I would suggest that it be wide enough to accommodate the longest piece of iron to be bent. Also that it have one door opposite the one at which the men are working, so when there is a piece of iron of extraordinary length it can be put through the opposite door. The furnace should have two burners at one end and a stack at the other, to draw off the surplus heat and gases, so that the machine can be placed close to the furnace door and save unnecessary expense in handling the material. No combustion chamber or firebox is necessary with this furnace, as no welding is done with it, and the burners can be run right into the furnace.

There is another kind of furnace that I wish to call to your attention. This is a special furnace for use in straightening steel underframing for freight cars. When cars are wrecked everything is done to them except tie them in a knot. In some cases they are about 40 ft. long and 20 in. wide, so I built a special furnace for them. This furnace is 9 ft. long, 30 in. wide and has two air burners on one side and two doors, one at each end, so that we can run the sheets clear through and heat them at any place where they are bent. This is a very good furnace for this class of work, as it can be erected at any place needed, and with very little expense air can be run into it, and a car of oil set out next to it. The oil cars are of sufficient height to run the oil into the burners by gravity. By this process an 8-ft. heat on a sheet ½ in. thick can be made in about five minutes.

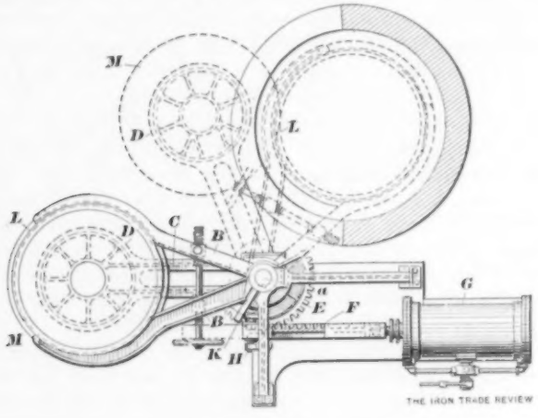
In conclusion I wish to say that I am a firm believer in oil furnaces, as the work that we turn out with them is double and even sometimes treble the work done with coal or coke. Even if oil were considerably higher and coal proportionately low, it would pay to use oil on account of the greater output of work.

New Contracts for American Shipbuilding Co:—A total of seventeen boats under contract is the situation at the shipbuilding company's works. Two new contracts were received two weeks ago, and one last week, the first from Herbert H. Oakes, of Detroit, representing Buffalo and Detroit interests, who placed an order Aug. 30 for a big lake carrier to be delivered April 12, 1906. The steamer will be 545 ft. long, 55 ft. beam, 31 ft. deep with a capacity of 10,000 tons. It is to cost $400,000. Immediately following came an order from William M. Mills, of Tonawanda, for a new boat to be a duplicate of the four built for the Pittsburg Steamship Co. The new boat will be 569 ft. over all, 549 ft. keel, 56 ft. beam and 31 ft. deep. She will have triple expansion engines and Scotch boilers. The new boat will cost $425,000 and will come out at the opening of navigation in 1906. The order for the last boat came from Chas. O. Jenkins, of Cleveland, and calls for 1906 delivery. This freighter will be 500 ft. over all, 480 ft. keel, 52 ft. beam and 30 ft. deep. She will have triple expansion engines with cylinders 22½, 36 and 60 in., with 42-in. stroke. She will have two Scotch boilers 13 ft. 9 in. in diameter and 11½ ft. long, to be fitted with the Ellis & Eaves draft, and will cost $320,000.

CUPOLA CHARGING DEVICE.

Charles R. Knapp has patented a cupola charging device whose object is to provide for the even distribution of the pig iron, coke or scrap within the cupola and to prevent the depositing of the materials in piles. The invention comprises in general a receptacle adapted to hold the material and means for swinging the same in a horizontal plane in order to enter an opening in the cupola. Means are also provided for releasing the material from the receptacle while within the cupola.

In the illustration, a frame or housing is bolted to the floor placed a short distance below the opening in the cupola which serves as a charging door. A vertical shaft *a* is mounted in the frame, this shaft being movable within the frame. The arms B are mounted on the shaft, the outer ends of the arms being curved. The arms are provided with a bolt and threaded nuts, the bolt being operated by a hand wheel. The bolt serves to draw the arms toward each other or separate them, as the case may be. The frame C is placed beneath the arms B, the frame carrying on its outer end the table D. A segmental gear E, which is engaged by the rack F, is secured to the journal of the frame C. The rack is attached to the piston rod of a steam, hydraulic, or other class of cylinder G, which is shown at one side of the



CUPOLA CHARGING DEVICE.

cupola. The steam or other operating fluid may be admitted to either end of this cylinder, as desired. The outer end of the rack rests upon a friction roller H.

A swinging dog or detent K is pivoted between lugs on the frame. This dog is adapted to lock the arms D as desired. Below the line of the floor upon which the machinery is placed is a pit, within which is supported a hydraulic cylinder. The plunger of this cylinder carries a platform upon which a track is formed. Trucks mounted on wheels which run on this track are adapted to move from the charging floor on to the tracks on the platform. The platform is in such a position with reference to the frame that when the truck is moved onto the platform, the table D of the frame C passes into the space between the axles of the trucks and the upper edges of the trucks. The box or receptacle L, which is preferably circular in form, is supported on the truck heretofore mentioned. The truck is provided with stops, which regulate the position of the bottom of the receptacle L with reference to the truck and prevent its displacement from the truck.

In the operation of the cupola charging device, the bottom of the receptacle L is first placed upon the truck, being controlled by the stops. The receptacle L itself is next placed over the bottom and the pig iron, scrap or other materials which it may be desired to charge into the cupola are loaded into the box. The truck carrying the receptacle L is then transported over a suitable track on the charging floor until it reaches the platform, when it is pushed on to the track on the platform. The table D will pass between the axles and the bottom plate of the truck and rest on the truck. The arms B are extended to permit the passage of the receptacle L and by turning the hand wheel the arms are brought together so that the curved portions will engage the receptacle L and meet the flanges on its upper edge. The plunger of the hydraulic cylinder underneath the charging floor is lowered, carrying with it the platform and the truck. As the platform is lowered, the truck which supported the bottom plate of the receptacle L is withdrawn and the bottom plate then rests upon the table D. Steam or other operating fluid is next admitted to the end of the cylinder G, thereby advancing the rack F. This imparts a rotary motion, by means of the segmental gear, to the frame C, the frame swinging into a horizontal position upon the shaft, carrying with it the receptacle L and its bottom plate. The arms D are likewise caused to move in a horizontal plane on the shafting A as an axis, the receptacle L thus being swung around so as to enter the charging door of the cupola, as shown by the dotted lines. In this position the receptacle L is practically concentric with the cupola. A latch bar is then dropped into such a position as to prevent the return of the arms to their original position.

When the receptacle L has been placed in the position indicated by the dotted lines the operator reverses the cylinder G by admitting steam to the front end, whereupon the rack bar causes the reverse movement of the segmntal gear E. This reverse movement withdraws the bottom plate from the receptacle L and the contents of the receptacle are discharged into the cupola. Owing to the concentric position of the receptacle L within the cupola and the withdrawal of the bottom in this manner, the contents of the receptacle are deposited evenly over the area of the cupola so that all parts receive an even proportion of the materials, which cannot collect in a single pile in any one part of the cupola. A further movement of the segmental gear brings the frame C and the table D back to their normal position, while the receptacle L remains in the cupola. After the contents have been discharged from the receptacle, the arms D may be grasped by any suitable device and withdrawn from the cupola, carrying with them the receptacle L, and they may then be swung around to their normal position. The receptacle L is then brought around into position over the bottom plate and by operating the hydraulic cylinder the platform and truck may be raised and the entire operation may be repeated.

Edict Against Chinese Boycott.

China has placed the boycott of American products under an imperial ban. An edict has been issued by the Government commanding viceroys and governors of provinces to take measures for the suppression of the boycott and holding them strictly responsible. The state department at Washington has received a cablegram from Minister Rockhill at Peking giving a summary of the edict. The cablegram was forwarded immediately to the President, and by his direction Secretary Loeb made it public. The text of the cablegram follows:

"Imperial edict published yesterday states that the long and deep friendship between the United States and China has never been tried as now. The United States Government has promised to revise treaty and people should peacefully await action of both Governments. Boycott wrong and harming friendly relations. It (edict) commands viceroys and governors to take effective action, making them strictly responsible. Undoubtedly will have a good effect. Shanghai reported yesterday situation improving."

PIG IRON FOR FOUNDRY WORK.*

BY P. MUNNOCH.

Pig iron varies in character and composition according to the class of ore or mixture of ores, from which it is produced, and also according to the methods employed in smelting, as well as the character and quantity of fuel and flux used.

Pig irons produced in any one district from similar ores are usually similar in character, though from time to time considerable variation occurs in the composition of the iron from any one furnace, and mainly upon this fact depends the necessity of employing a chemist in the foundry, as otherwise, mixtures once found suitable for any particular casting, or class of castings, could always be relied upon to give the same results. However, owing to the variations occurring constantly in all pig irons, though in some respects some vary considerably more than others, the same brand or mixture of brands are found in actual practice to give very different results at one time, compared with another.

As the pig irons produced in different districts vary in composition, and therefore in character, the founder, by mixing irons from different districts, is enabled to produce compositions suitable to the various requirements of the different castings, upon the production of which he may be engaged. These mixings which are the result of careful trial and observation, are usually suitable for the purpose for which they are required, though sometimes the reverse is the case; but the variations occurring in the compositions of the different irons used often produce quite a different result from that desired.

The distinctive character of any brand depends upon its composition. The grade or quality depends chiefly upon the amount of sulphur, silicon, and total carbon present, and also upon the temperature of the metal leaving the furnace, and upon the conditions of casting and cooling.

There is no sharp line of demarcation between the grades of iron produced at the blast furnace, one grade gradually merging into another; therefore it will be seen that the iron delivered will depend, to a certain extent, upon the ideas of the sampler, and no doubt the amount and grade of the iron made at the furnace, as compared with the orders on hand, to some extent influence his judgment.

Table I gives typical analyses of pig irons from different districts. These are chiefly from the author's own analysis, one or two having been added to make the list complete. No. 3 iron is taken in each case for sake of comparison.

Variations in the Composition of Pig Iron.

In ordinary foundry pig irons the variations in the amounts of total carbon, phosphorus, manganese, and sulphur are generally small compared with the variations of silicon. This element varies to a very great extent from time to time, and a variation of two percent or even more may be met with in the same delivery of iron.

This is an extreme case, but a greater variation than this is possible, and may occur in any one grade of the same brand.

As a rule irons made in the same districts from similar ores are similar in composition. The different brands, however, differ slightly. One may usually be high in silicon and low in total carbon, and another usually low in silicon and high in total carbon. In others there may be a difference in the amount of phosphorus, manganese or sulphur. All, however, will be found to vary to some extent from time to time, though some vary to a considerable extent more than others.

An alteration of some of the details in the method of manufacture will often produce a difference in the general composition of the iron made.

Where irons are made from mixtures of ores there is usually more variation in the manganese and phosphorus than is the case where irons are made from one class of ore.

As a general rule in any one brand of iron, as silicon increases, sulphur decreases, and as silicon goes down sulphur goes up. This rule, however, cannot be applied haphazard to any collection of pig iron samples, as a high silicon is frequently associated with a high sulphur, and a low silicon with a low sulphur.

Table II contains an example of ideal analyses and grading of Cleveland (Eng.) iron. Also several examples of extreme variations actually found in the irons used at works of Messrs. Richardsons, Westgarth & Co., Ltd., Mid-

TABLE I.

Typical Analyses of Pig Irons.

	Grade.	Combined Carbon.	Graphitic Carbon.	Manganese.	Silicon.	Sulphur.	Phosphorus.
Cumberland Hematite	No. 3	.17	3 51	.14	2 49	.040	.035
East Coast Hematite	No. 3	.47	3.32	.87	2.33	.057	.050
Cleveland	No. 3	.17	3.00	.50	2 75	.050	1.54
West Yorkshire	No. 3	.35	3.10	.05	3 00	.063	.97
Lincolnshire	No. 3	.75	2.76	1.80	2.14	.036	1.27
Derbyshire	No. 3	.35	2.97	.80	2.47	.035	1.40
Northamptonshire	No. 3	.08	3.04	.39	2.75	.030	1.69
Nottinghamshire	No. 3	.15	3.39	.40	2.70	.040	1 10
Lancashire	No- 3	.18	3.25	.71	3.03	.051	.67
North Staffordshire	No. 3	.47	2 90	2.05	2 50	.035	1.25
Ayrshire	No. 3	.47	3 01	.89	2.33	.027	.56
"	No. 3	.43	2.57	1 49	2.63	.033	1 15
Lanarkshire	No. 3	.19	3.10	1.50	3.15	.014	.81
Stirlingshire	Close No. 3	.68	2.72	1 08	1.56	.101	.61
South Staffordshire	Cold Blast	.55	2 50	.55	1.05	.101	.48
North Yorkshire	Cold Blast	63	2.52	.48	.98	.046	.10

TABLE II.

Variations in Analyses of Pig Iron.

Cleveland Eng. Iron.—Ideal Analyses.

Grade.	Combined Carbon.	Graphitic Carbon.	Manganese	Silicon.	Sulphur.	Phosphorus
No. 1	.10	3.30	.65	3 50	.02	1.60
No. 2	.15	3.20	.65	3.30	.03	1.57
No. 3	.30	3.00	.60	2.75	.05	1.57
No. 4 Foundry	.40	2.85	.55	2.25	.08	1.55
No. 4 Forge	.70	2.50	.50	1.75	.13	1.57
Mottled	1 30	1 77	.30	1.10	.25	1.58
White	3.05	nil.	.20	75	.45	1.60

Cleveland Eng. Irons.—Actual Analyses.

No 1	.15	3.15	.60	2.50	.033	1.59
No. 3	nil.	3.10	.55	3.65	.040	1.39
No. 3	.80	2.60	.57	1 40	.054	1.54
No. 4 Foundry	trace	2 95	.01	3 53	.033	1.51
* " "	.56	2.69	.40	2.10	.081	1 00
* " "	.97	2.47	.59	1.21	.075	1.58
† " "	from			2.24		
† " "	to			3.96		
No. 4 Forge	50	2.65	.40	2.45	.095	1.61
No. 4 Forge	1.12	2.17	.37	.93	.141	1.56
Mottled	1 46	1.76	.32	1.75	.280	1.59
"	.90	2.30	.31	.93	.237	1.63

Hematite Irons.

No. 1			1 35	5.25		
"			.93	2 39	.027	.06
"	.86	3.77	.72	1 04	.027	.006
No. 2				1.75	.028	.06
"	.92	3 14	1.38	1 23	.043	.06
No. 3	.55	3 15	.75	1.40	.040	.06
"	.45	3 33	.90	3.10	.030	.06
No. 4 Forge	.40	3 02	1.12	2.91	.095	.042
"	.73	3.13	.48	.60	.116	.065

*Same delivery. †Same delivery.

*Read before the Cleveland (Eng.) Institute of Engineers.

dlesbrough, and are inserted by permission of Mr. T. Westgarth, managing director.

Influence of Composition on Grade and Fracture of Pig Irons.

No. 1 iron is usually higher in total carbon and manganese than the lower grades and also lower in sulphur. Silicon is generally, but not always high. As the grade goes down sulphur and combined carbon increase, whilst silicon and manganese generally decrease. Irons rich in total carbon have a much darker and more open grain than irons otherwise similar in analysis which contain a lower total carbon. This is due to the higher content of graphite. Irons with a low total carbon usually have close grain and a light colored fracture.

Sulphur to a large extent controls the grade as determined by fracture and also controls the combined carbon. Combined carbon usually increases with increase of sulphur. Irons low in sulphur usually have a large open grain; as it increases the grain becomes closer.

With a high total carbon sulphur may be increased slightly above the normal without affecting the grain; in this case there is usually an increase in combined carbon. Silicon in ordinary normal foundry irons appears to have only a slight effect on fracture and grade. When silicon increases it usually displaces total carbon, thereby lowering the combined carbon. Iron with above four percent of silicon usually shows a silvery appearance, and is called glazed iron. With a low silicon a relatively higher total carbon is necessary to give an iron a similar appearance to one which contains a higher or normal silicon.

Iron low in silicon is very sensitive to the action of chilling and this is greatly influenced by both sulphur and manganese. Manganese in ordinary foundry iron does not appear to have much effect upon appearance of fracture when below about three percent, although the presence of much manganese renders the iron hard to drill or machine. Practically the effect of manganese is to increase the combined carbon without affecting the grade as determined by fracture. Combined carbon does not appear to have a great effect on the appearance of pig iron except when the iron begins to show a forged or mottled fracture.

Phosphorus has practically no effect upon the grade of pig iron as determined by appearance of fracture. As phosphorus increases total carbon decreases, and the normal amount of total carbon varies from about 3.75 percent in normal hematites down to about 3.30 in normal Cleveland irons containing 1.5 percent of phosphorus, that is to say, with an increase of 1.5 percent of phosphorus there is a decrease of 0.45 percent of total carbon.

Phosphorus has no effect upon combined carbon, but as phosphorus increases the iron shows a lighter color, due to the phosphide of iron present.

The appearance and grade of pig iron is affected to a great extent by the varying conditions of casting and cooling. This makes it a difficult matter to determine the effect of composition on fracture with any degree of certainty.

Mixing by Analysis.

The object of this is to turn out castings of uniform analysis.

As the physical or mechanical properties of cast iron depend on its chemical composition, together with the effects of the conditions of melting, casting and cooling, it may be taken as a general rule, that metal of similar analysis, melted, cast and cooled under similar conditions, will produce resulting castings having similar physical or mechanical properties. This leads to the foundation of mixing by analysis, that, if the resulting metal is of the same analysis and the other conditions are the same, the castings produced will have the same properties, independent altogether of the brand or brands of iron used. The chemist, therefore, given irons of suitable composition, is able to produce an iron having the composition and character of any particular brand of iron.

This in turn brings forward the fact, that the properties of such special irons as cold blast depend upon the composition; cold blast is only the means of producing this composition, and if an iron having the same composition, could be produced by means of hot blast, the iron would have the same properties.

Furnaces working with hot blast usually produce an iron having a higher total carbon when making iron which is otherwise similar in analysis. It is possible to reduce the total carbon by the addition of steel and thus duplicate cold blast irons.

Selecting and mixing irons by analysis renders the founder independent of any particular brand or brands of iron, and enables him to substitute low priced for high priced ores. The low priced irons may in some cases be more suitable than the higher priced irons. In some districts, and with some classes of work, the saving to be effected is very small, and the chief benefit obtained is from the greater regularity of the composition and mechanical properties of the castings produced.

The founder who is so placed that he has irons from different districts at his disposal is enabled to change his irons as the markets change, and at the same time produce castings of suitable composition and mechanical properties. The ideal method of working is to buy irons by analysis. At the present time this is a difficult matter, as few makers of pig iron are willing to sell by analysis. Those who are willing to do so require a higher price for selecting the iron.

At the present time, therefore, irons must be bought by grade and as they vary from time to time, a certain amount of stock must be kept for mixing. This is not so much a question of large stocks as a judicious selection of irons which can be used to correct any irregularities which may occur from time to time in those bought, and which may also be used for producing mixings for castings requiring special or unusual composition.

Usual Composition of Castings.

It is by no means necessary when in any particular district, to turn out castings of the same analysis as would be done in another district, where the irons within reach of the founder may be different in composition. In those districts where high phosphorus irons are cheapest, phosphorus will be found to be higher in the general output of castings than is the case where irons of a lower content of phosphorus are cheaper; the same also applies to manganese.

Castings for machinery and general engineering work vary greatly in composition in different districts, but as a general rule the phosphorus averages about 1 percent. This may be due to the fact that the general average of all the pig irons produced in this country is about one percent phosphorus.

Manganese usually varies from .3 to 1.5 percent, but the average is about .7 percent.

Silicon may vary from 1.0 to 3.0 percent. The average is about 1.8 percent. Total carbon usually 3.2 to 3.5 percent.

Combined carbon varies to a very great extent. In some cases the total carbon is entirely in the form of graphite, in others the greater part may be combined. Combined carbon may vary to a great extent even in the same casting.

Sulphur usually varies between .03 percent and .15 percent.

In special engineering castings where great strength is required, total carbon, manganese, silicon, and phosphorus, are usually all low. For castings requiring to be extremely soft and tough, hematite iron alone is used.

Iron for special castings is in some cases remelted once or twice before casting. This is only necessary when a higher

grade of iron than is required is being used. Where reasonable care is taken in the weighing of all materials charged into the furnace, the results will be quite as regular without this remelting. The effect of remelting in the cupola is equivalent to lowering the grade. Usually silicon is decreased by .2 to .3 percent. Sulphur usually increases to the extent of .02 to .04 percent. About 25 percent of the manganese is lost.

Total carbon increases or decreases according to the amount present, whether below or above the normal.

With regard to mixing by analysis applied to the foundry, this cannot be a success unless the necessary requirements are observed. These are briefly, a reasonable amount of stock of the different brands and grades of iron necessary and a small stock of extremes for correcting variations.

Sufficient yard room for stocking purposes; this should preferably be near the copula to save unnecessary handling; suitable means for weighing all materials charged into the furnace; unless these requirements are complied with it will be impossible to mix by analysis.

The question as to whether or not an analyst is of benefit to the foundry, is a delicate one for him to attempt answering, and can only be answered by those who employ one.

BOOK REVIEWS.

The Thomas Discount Book, compiled and published by Millward T. Thomas, Williamsport, Pa. 84 pages. 5 x 8 in. Supplied by *The Iron Trade Review* at $1. Leather $1.25.

The author of this book after years of experience in figuring discounts has realized the necessity of a practical book of discounts which will lighten the mental strain of finding these quantities. He has, therefore, compiled this discount book, which consists of a series of tables showing all the discounts from 2½ percent to 90 percent inclusive. By means of this book the net of any amount, discounts for specified lists and the making of lists for specified discounts, and the percentage of profit on any article can be easily and quickly found. The book is side indexed, making it extremely easy to turn to the table of any specified discount.

Practical Planer Kinks, by Carroll Ashley, New York. The Hill Publishing Co. 5 x 7½ inches. 80 pages; numerous illustrations. Supplied by *The Iron Trade Review* at $1.

True to the title of the book, the author has filled it full of practical planer kinks from one end to the other, including first, a description of the planer as a tool, which occupies only a little over three pages. This is followed by three pages upon the planer hand, or operator. Tools and equipment are next taken up and treated broadly but thoroughly, the work containing a very large number of illustrations. Among some of the special kinks referred to are methods for lining up the rail, cautions to be taken in planer work, chucking, planing cored work, planing all over, grinding on the planer, circular planing, under which head a number of devices for this class of work are described and illustrated. It also gives methods of cutting spiral grooves on the planer, and the planing of work too large for the capacity of the planer.

All the way through the work the author shows how thoroughly familiar he is with every little kink and short cut used in this class of work. He also shows that he appreciates the humor of shop directions as frequently given and repeats some as examples. All these points serve to make the book exteremely interesting reading to the man who appreciates the true spirit of shop work, and it is only by being in harmony with this spirit that any one will get the greatest good from any study of shop methods.

This handy little work should not only be in the hands of all planer operators, but also in the hands of foremen, superintendents, and men who have to design methods of doing work.

TREATMENT OF HEAVY CASTINGS TO PREVENT THE FORMATION OF FLAWS.

In a recent issue of *Stahl and Eisen* an article appeared on the treatment of heavy steel castings to prevent the formation of flaws. The following is an abstract of that article:

In consequence of the increasing demand for heavy steel castings manufacturers have been forced to seek continually for methods of preventing the commonly occurring flaws in such pieces. Especially in Europe have such investigations been followed out with the result that various schemes for using pressure and prolonged heating have been tried.

In one of the steel foundries of Germany a new process has been in operation for about a year, which for economy and ease of operation seems to recommend itself to the foundryman. The essential feature of this method is the application of external heat to those parts of the casting cooling first and by the maintenance of a uniform temperature throughout the casting, avoiding the strains and inequalities that usually result in pores.

Heat is obtained by forcing cold atmospheric air over a bed of glowing charcoal, so regulating the blast and quantity of air that carbon monoxide forms, which in turn is burned completely into the dioxide in contact with the casting, thus heating it.

The operations of the process are: The heating apparatus is completely filled with hard coal pieces, the size of one's fist. About an hour previous to the "pour" the coal is brought by a gradual variation of the blast to a red glow. The heating apparatus is in the meantime brought over the mold and by means of a regulated flame the heating of the mold and especially of the fireproof composition or lining is accomplished. Shortly before the pouring begins the apparatus is removed from the mold which prevents the full force of the blast acting further. During the pouring of the casting (according to the size of the piece, from 15 to 25 minutes) the whole coke contents of the heat is brought to a clear red glow, necessary for the continuation of the process. Immediately after the completion of the pour the apparatus is drawn back over the mold and the heating begins.

The heater is suspended on small trucks of such a size that they can be easily and quickly run over the middle of the mold immediately after the termination of the pouring. Since no preliminary warming of the air is necessary, the blowers producing the air pressure can be placed in close proximity when the pour is being made, thus avoiding any long pipe connections. The whole proposition is, as a result, an extraordinary simple and feasible one. The first cost for the apparatus amounts, including that of the truck and high pressure blower, to about $1,250 to $1,500. The operating cost, depending upon the size of the casting, to about 15 to 25 cents per ton, omitting royalty, and is itemized as follows:

Coke used per ton	$0.06 to .10
Wages	.06 to .10
Maintenance (material, etc.)	.03 to .05
Total	$0.15 to .25

The economical advantage of this treatment is from the following reckoning easily made apparent. Suppose for a casting or large ship plate, a block of 33,000 lb. net weight is necessary, that is, the block must contain 33,000 lb. of solid material. A loss of 25 percent allowed for porosity would necessitate the rough block weighing 44,000 lb. A loss of 10 percent would require for the same purpose 36,600 lb. in the rough. If we take a block price of $21.25 per ton and scrap price of $15 per ton there results a saving of $1.40 per ton. A similar saving occurs in the working operation, press frame work, and roller work, in coal heating, operating force and wages.

POSSIBILITIES IN BLAST FURNACE ECONOMY.

BY HORACE ALLEN.

Has the efficiency and economy of the blast furnace reached finality? As practically the whole of the iron produced in the world is smelted in the blast furnace, and its present equipment is the result of continued improvements in details by practical and scientific workers, the natural consequence is that this method of converting the oxides of iron into metallic iron has reached a high state of efficiency.

However, the progress of scientific investigation leads to the question as to whether it may not be possible to devise new methods and apparatus which will be capable of obtaining the required result at less cost than the older system.

Whatever the apparatus or method employed the object in view is the reduction of iron from its oxides and it is proposed to deal with this from a thermo-chemical point of view.

To avoid tediousness and too much scientific detail only approximate figures will be given as they will answer present requirements.

In the first place we will assume that the source of iron supply to be dealt with is in the form of ferric oxide, Fe_2O_3, as, though the magnetites, carbonates, etc., contribute largely to the world's production, the fact that the processes of preparation either outside or inside the furnace generally results in iron being reduced to the state of peroxide, it will simplify matters to refer only to the reduction from Fe_2O_3 and to deal with the resulting metal as being pure iron, Fe.

Now in the blast furnace it requires the most favorable conditions and a readily reducible ore to enable a ton of pig iron to be produced by the consumption of 17 cwt. of coke, or to bring our units down to pounds, one pound of pig iron made in a blast furnace requires the employment of 0.85 lb. of coke.

Taking the thermal value of the coke at 13,000 B. T. U. per pound, each one pound of iron results from the expenditure of $0.85 \times 13{,}000 = 11{,}050$ B. T. U.

The application in recent years of the electric current to the smelting of iron from its ores has proved that as far as the actual "reduction" is concerned 767 lb. of coke will suffice to reduce one ton of pig iron, or for one pound of iron 0.34 lb. of coke. According to the chemical equation:

$$\underbrace{Fe_2O_3}_{56\times2\ 16\times3} + \underbrace{3C}_{3\times12} = \underbrace{2Fe}_{2\times56} + \underbrace{3CO}_{1216}$$

$$\underbrace{112\quad 48}_{160} \qquad 36 = \underbrace{112}_{} \qquad \underbrace{3\times28}_{84}$$

One pound of iron would require 0.32 lb. of carbon, so that there is no great excess in the coke for reduction only in the electric furnace in practice.

Though the blast furnace, owing to the complicated chemical reactions which its form and conditions involve, may not be able to reduce one pound of iron with 0.34 lb. of coke, the electric furnace has demonstrated that only that weight is actually necessary.

To use the blast furnace as a basis of comparison, however, we may put it that per pound of iron

For reduction	.34 lb. coke
Heat	.51 lb. coke
	.85

and further, $.51 \times 13{,}000 = 6{,}630$ B. T. U. as the total heat capable of being developed by .51 lb. of coke.

To turn again to the electric furnace, it is found that for the heat requirements of smelting one pound of iron there must be provided 0.88 unit, which is equivalent to 3,000 B. T. U., as against 6,630 B. T. U. in the blast furnace, but possibly in large installations this figure may approach or come below the blast furnace. The reason why the electric furnace cannot at present compete with the blast furnace is the cost of current, so what is now necessary is to consider whether any other means can be employed to supply the heat requirements at a cheaper rate.

We can turn now to the open hearth furnace as employed for steel manufacture. In this a temperature above that of molten steel, 3,270° F. is maintained for an expenditure of about seven cwt. of coal for each ton of steel produced, and as the process of steel manufacture is not very rapid it is probable that the same amount of heat would only be necessary to bring about the reduction of one ton of pig iron.

This would give per pound of iron, in a combined blast and open hearth furnace,

For reduction	.34 lb. coke
For heat	.35 lb. coal
	.69

Taking the coal at 13,000 B. T. U., $.35 \times 13{,}000 = 4{,}550$ B. T. U., as against 3,000 B. T. U. in the electric furnace, and this roughly gives a saving of seven cwt. of coke per ton of pig iron over the blast furnace.

As one pound of iron would be 1,428 lb. as oxide, and with a specific heat of .17, at a temperature of about that of the tuyeres of a blast furnace, say 4,000° F, we get $1{,}428 \times .17 \times 4{,}000 = 971$ B. T. U. as the theoretical quantity of heat necessary to bring about the reaction between the oxide of iron and the carbon for reduction. This is so considerably below any of the figures given above, i. e., 6,630 B. T. U. as the minimum in the blast furnace, 3,000 B. T. U. in the electric furnace, or 4,550 B. T. U. in the open hearth furnace, that there is great probability that even the lowest of these figures will be very much reduced towards the theoretical quantity in course of time.

In the electric furnace for smelting iron from its ores, as described and illustrated by W. Albert Keller,* the furnace was to all intents and purposes a blast furnace shaft superposed over an open hearth furnace, but the heat supply came from carbon electrodes instead of gas and air on the regenerative principle.

Though 4,000° F. has been taken as the temperature of the tuyeres of a blast furnace it is most probable that the reaction between ferric oxide and carbon may take place at a much lower temperature. Minerals melt and slags form at from 2,500 to 2,600° F., while the fusing point of magnetic oxide is about 2,370° F., so in the figure given for the heat necessary for the reaction, 971 B. T. U. is probably much in excess of that which will be necessary in a well designed furnace. Again the reduction of the oxide in the manner described would be accompanied by the evolution of a considerable volume of nearly pure carbonic oxide gas CO, as shown in the equation; each pound of iron reduced results in 0.75 lb. of CO being liberated, or for one ton of pig there would be given off 1,680 lb. of CO, or by volume at 60° F., 22,736 cubic feet.

The CO liberated per one pound of pig iron would be capable of developing 3,270 B. T. U., or about that necessary for bringing about the reduction if it can be applied for that purpose.

One pound of iron reduced from Fe_2O_3 requires	3,650 B. T. U.
1.428 lb. oxide $\times$.17 sp. ht. $\times$ 4,000°	971 B. T. U.
Total theoretical heat absorbed	4,621 B. T. U.
.321 lb. of carbon burnt to CO evolves	1,428 B. T. U.
Therefore, the heat to be supplied per pound of iron	3,193 B. T. U.

These considerations and figures appear very promising, and it only remains for some enterprising firm to experiment in this direction.

In regard to the purity of the ore most suitable for such treatment as proposed, it must be borne in mind that roughly speaking it requires as much coke to produce a ton of slag as a ton of pig iron. So that if it is necessary to employ concentration to render the ore suitable for smelting in the combined furnace there is to be offset against the cost the saving of fuel resulting from the employment of the purer material.

The proposed new method of smelting would not necessitate the ore being in the form of more or less large pieces, or briquets, as even iron sand would probably be satisfactorily dealt with under the new conditions.

*Meeting of the Iron and Steel Institute, 1903.

NEW BLAST FURNACES

OF MODERN TYPE WILL BE BUILT BY AN ENGLISH CONCERN.

Marked Signs of Improvement in Iron Trade in Great Britain—Exports to the United States.

(Special Correspondence.)

BIRMINGHAM, England, Sept. 1.—Gust, Keen & Nettlefolds, owning the largest British concern, have just decided to erect two or three additional blast furnaces of the most modern type on a site adjoining their Dowlais steel establishment. The output will be about 3,000 tons weekly, bringing the firm's total production to 10,000 tons. The steel works will be extended to deal with this additional pig. The progress of this concern under the initiative of Arthur Keen is one of the most remarkable chapters in the record of British industry. The concern is capitalized at £3,000,000; its land, buildings and collieries, etc., are worth nearly this amount, and its total assets are about six millions. Within the last three years it has absorbed some of the most extensive works in the kingdom, including Nettlefolds, Birmingham, the concern which built up Mr. Chamberlain's fortune.

The signs of improvement in the iron trade continue to multiply, and are coming from a variety of sources which leave no doubt of its substantial character. Apparently the recovery applies to all branches. From Cleveland comes the news that pig iron exports for August have exceeded those of any month during the present year. During last week a large number of orders for Cleveland and hematite brands were placed, including one of 25,000 tons of the latter description for America. Hematite makers have, accordingly, advanced their prices. Several firms are making arrangements to blow in additional furnaces, the most striking example of the kind being that of the Barrow Hematite Iron & Steel Co., which is relighting a furnace that has been out of blast for the last ten years. At the Crewe works of the London & Northwestern Railway Co., where some 4,000 to 5,000 hands are employed in the building of the company's locomotives and general railway rolling stock, the managers have been able to resume full time after running for a considerable period four days per week. Several hundred men who have been unemployed will now find work. During the past week there have been some substantial shipments of steel rails, Messrs. Camell, Laird & Co. sending away a cargo of 4,000 tons to Alexandria, a second of 1,500 to the Baltic, and a third of 1,600 to Antofagesta. The steady rise in sheets continues to be the striking feature of the trade, the Galvanized Iron and Sheet Association having just added a further half-crown to the standard prices, making the figure £10 15 s; but it is notorious that some firms have been getting £10 17s 6d, and even £11 is by no means an impossible figure. The general condition of affairs is causing some anxiety to those consumers who have not yet placed their orders for supplies.

A good deal of interest is being taken by the iron trade in an arrangement recently entered into between Messrs. Guest, Keen & Nettlefolds and a number of German firms with regard to prices for screws. Some years ago Messrs. Nettlefolds, one of the most important of the allied companies, obtained a monopoly of the screw industry, and some sharp criticism has occasionally been evoked by their frank adoption of "dumping" methods. Their screws are sold to foreign countries at prices materially below those obtained from British customers, and they have thus captured an enormous share of the world's trade. But within the last two years they have been considerably nonplussed by a German combination which has placed screws on the British market of excellent quality at a figure materially below the Birmingham price. Both parties have apparently now got tired of the game of "diamond cut diamond," and an arrangement has been come to with the Germans defining the selling area, with the object of maintaining the statu-quo, and so modifying discounts as to raise the price of screws 50 percent. Broadly speaking, discounts have been reduced from 80 percent to 70 percent, thus compelling the purchaser to pay £30 for screws recently costing £20. The promoters are hopeful of success, but it is admitted that the agreement comprises only a proportion of German makers, and the remainder, unless they fall into line, are quite capable of wrecking the scheme.

The large extensions by Guest, Keen & Nettlefolds have just been referred to in this column. The company has just issued its annual report showing a profit of £407,557, and a divisible balance of £545,627, out of which they pay a dividend of five percent on the preference shares, and ten percent on the ordinary shares, placing £150,000 to reserve, and carrying forward £142,808.

Messrs. Bolckow, Vaughan & Co. report a better year, having increased their profits from £199,641 to £213,871. This has been effected concurrently with large expenditure on modernizing improvements, and the acquisition of new properties. The directors are setting aside £56,200 for extensions.

Among other companies which have had a successful year are Hadfield Steel Foundry Co., Sheffield, which has just declared an interim dividend of 10 percent, and the London & Glasgow Engineering & Shipbuilding Co. which pays a dividend of 7½ percent. The Moss Bay Hematite Iron & Steel Co., Ltd., which has made a profit of £21,666, pays a dividend of two percent.

An interesting device by Mr. Clark, an American inventor, has just been installed at the works of Messrs. Camell, Laird & Co., Birkenhead. It is to be used for bunkering vessels. It consists of a large barge with numerous false bottoms, the opening of which discharges the coal into a train of traveling buckets, which are carried up a perpendicular tower and discharged at any point required.

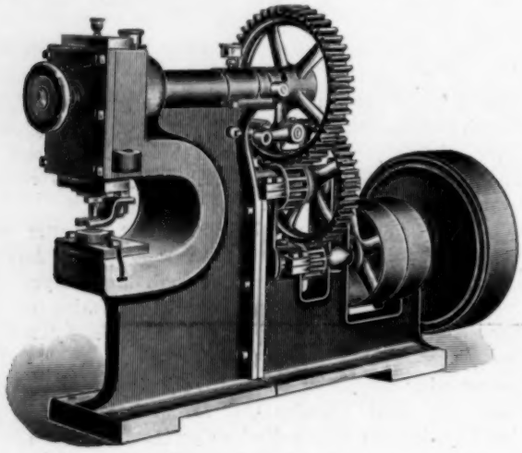
J. H. Hunt, one of the proprietors of the Chillington Tool Foundry, and a very well known figure in the Staffordshire iron trade, died recently as the result of injuries received in a cycle accident.

A New Electrical Directory.—The Blanchard Publishing Co., Rialto building, San Francisco, Cal., have brought out the first issue of the *Western Electrical Directory*, which is to be published annually, with reports quarterly. This book covers the electrical industries in the western part of the United States, including Alaska, and also the Territory of Hawaii, British Columbia, the Yukon Territory, Alberta, Saskatchewan, Assiniboia, and a portion of Mexico. In this directory are noted the names of companies and individuals operating electric light and power plants and electric railways; and also names of companies, if any, which have been absorbed or succeeded. The capital stock and bonds of these companies are given, together with the names of officers, superintendents, purchasing agents, electricians, etc. The locations and equipment of generating and sub-stations are also tabulated. If no stations are operated, the company from whom current is purchased is given. In addition to this, the mileage and number of cars operated by railway companies is given, together with general information which is needful to those who desire to keep advised regarding the electrical situation in the West. The electrical contractors and dealers, and consulting and contracting engineers are also listed. The book is a valuable one for any person interested in electrical engineering in the western part of the country to purchase.

A NEW BENCH PUNCH.

A punch designed for light work in metal working factories and to take the place of large and expensive punching machines for punching and shearing light bars, plates and sheets has recently been placed on the market by the Bicknell Mfg. & Supply Co., of Janesville, Wis. The machine is a modern, back geared one of great power. The balance wheel is near the base instead of above the frame, a feature which will be appreciated by all users.

Attachments for shearing and special work can be used;



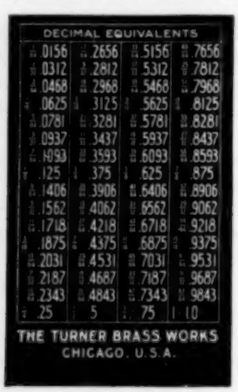
BICKNELL BENCH PUNCH.

all changes being quickly made. The floor space required for the machine is 18 x 40 in. The machine can be placed on benches or stands, or, if desired, it may be made portable. Its capacity is a 3/8-in. hole in 1/4-in. iron.

The manufacturer of this punch contemplates putting on the market a large floor bench of the same general design as the bench punch.

CARD OF DECIMAL EQUIVALENTS.

The Turner Brass Works, Chicago & Michigan streets, Chicago, Ill., has recently brought out for distribution a card of decimal equivalents, which its customers seem to think a



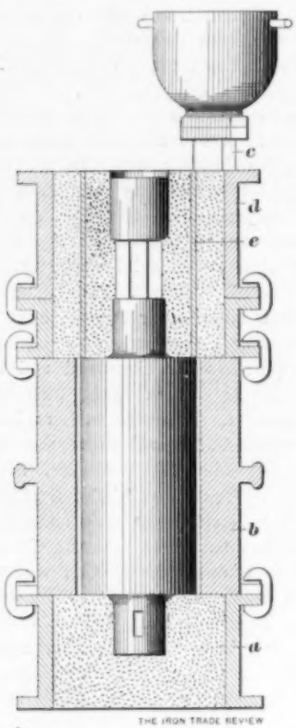
CARD OF DECIMAL EQUIVALENTS.

good thing. This card is illustrated herewith. The actual size is 5¼ x 3½ in., and it contains the decimal equivalents of fractions of an inch from 1-64 to 1 in. It is printed in yellow on a blackground, and a hole is punched in the top for convenience in hanging. The Turner Brass Works will be pleased to forward copies of this card post paid, to any subscriber of *The Iron Trade Review,* who may write requesting one.

MANUFACTURE OF CHILLED CASTINGS.

It is well known that not only the depth, but also the hardness of the chill on a roll or other article depends upon the rapidity with which the heat is carried away from the molten metal and the efficient persistence of the cooling action. The contraction of the molten metal during cooling and solidification and the expansion of the chill ring when heated, produce such a separation of the chill ring and of the cast metal that the former will not act by conduction to cool the cast metal, and the heat retained in the casting by reason of the heating of the chill ring and its failure to carry away the heat will produce an annealing or softening effect on the chill produced by the first contact of the metal with the chill ring.

An invention which has for its object the employment of



PROCESS OF MAKING CHILLED CASTINGS.

a chill ring which will act effectively during the internal cooling of the metal and the substitution of a second and preferably slightly smaller chill ring for the first, whereby the article will be subjected to a secondary chilling action, is the subject of a patent granted to Mr. Joseph S. Seaman, of Pittsburg. The invention is shown in principle in the accompanying illustration.

The mold, as regards the drag A, the chill ring B, and the runner C, is constructed in the usual or any suitable manner. The cope may be constructed, as is common, to permit the chill ring to be drawn up outside of it, or, as is preferable, the cope is made in two vertical sections, separated from each other by a thin metal ring E. The matrices for the roll-neck wabbler and sinker head are formed of clay within the ring E, which has an external diameter less than the internal diameter of the chill ring B. The space between the ring E and the cope frame E is filled with material such as sand, which will not cake or harden when heated. After the mold has been formed in this manner the metal is teemed in through the sprue, as is customary. The molten metal, in coming in contact with the chill ring, is cooled and hardened, and as the heat is conducted away from the metal by the chill ring the latter

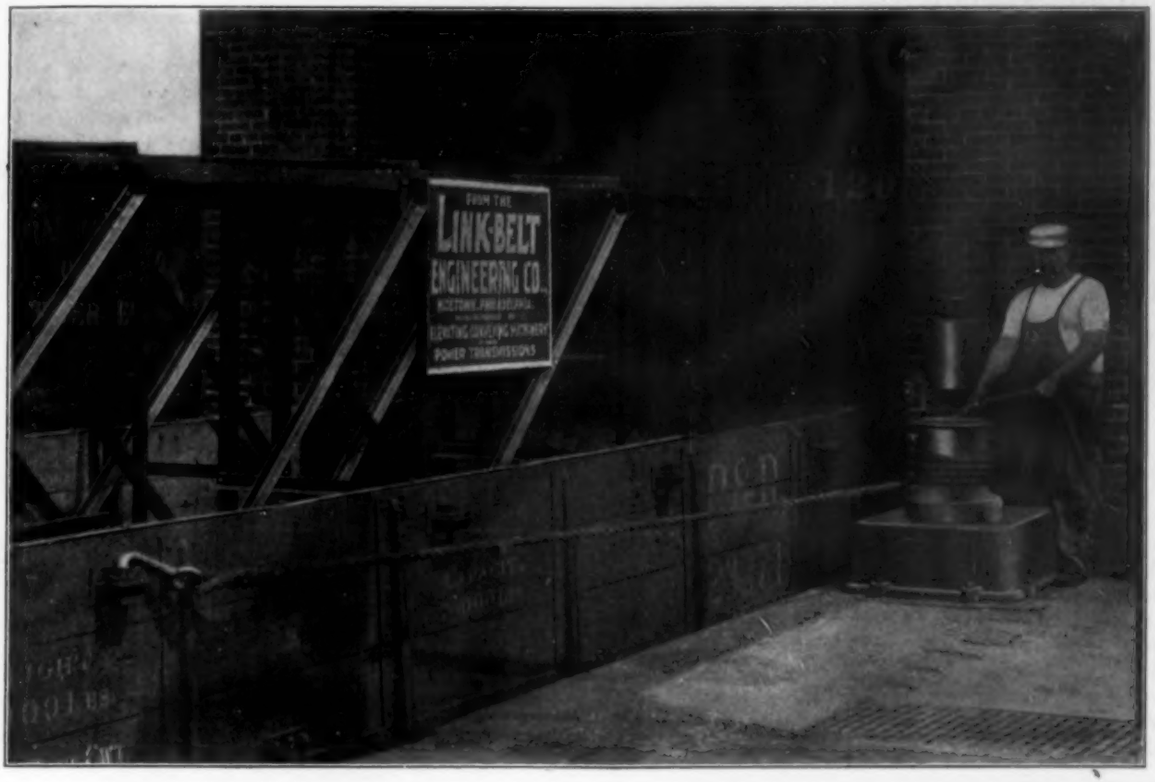
will expand and the casting will contract. These opposite movements will so separate the casting and the chill ring that the latter will no longer act with the desired efficiency. This loss of efficiency is due not only to the separation of the casting and chill ring, but also to the heating of the chill ring by the molten metal. As soon as this separation of the casting and the chill ring has taken place and the shell of solidified metal forming the chill of the casting has become sufficiently rigid to prevent deformation of the casting on removal of the casting, the cope frame and the material between it and the ring E are removed and the chill ring B stripped from the casting. The second chill ring, of slightly smaller diameter than the original, is slipped down on to the casting. As this ring is cold and will come in direct contact with the surface of the casting, a second chilling action will occur and will continue for a longer time, as the contraction of the casting at this stage is not so rapid as at first, nor will the second chill ring be heated and expanded as rapidly as was the original one.

Ohio Engineers' Meeting.—The Ohio Society of Mechanical, Electrical and Steam Engineers will hold its next meeting at Canton, Ohio, on Nov. 18 and 19, at which time there will be an election of officers, and some proposed changes in the constitution will be acted upon.

Canadian Plant Acquired.—The Niles-Bement-Pond Co. has completed arrangements for acquiring the business of John Bertram & Sons Co., Ltd., of Port Dundas, Ontario. The capacity of the plant will be doubled. Work will begin at once and about $300,000 will be spent in improvements. The acquisition of a plant upon Canadian soil will, it is said, give the company an advantage in competition for the trade of certain foreign countries.

A HEAVY ELECTRIC WINCH.

The Sprague Electric Co., New York city, has recently brought out the electric winch which is shown in the accompanying illustration. This winch, or windlass, is designed for pulling heavy loads short distances at slow speeds. The power that may be developed by it amounts to 300,000 foot-pounds at the winch, and can be furnished for any one of the five speeds and pulls. These speeds range from 25 to 150 ft. per minute, with a uniform difference of 25 ft. per minute between each speed. At 25 ft. per minute the pull on the rope is 12,000 lb. and at 150 ft. per minute the pull is 2,000 lb.



SPRAGUE ELECTRIC WINCH HAULING FREIGHT CARS AT WORKS OF THE LINK BELT ENGINEERING CO.

The winch finds its most profitable application in the hauling of freight cars or heavily loaded trucks into and out of shops, in drawing heavy articles on or off drays, in warping vessels through draw bridges and along docks, or for dragging heavy material along the ground in stone quarries, lumber yards, shipyards, etc.

The winch is entirely self-contained and can be transported from place to place as required or fastened permanently to a foundation. The motor and gears are enclosed in, and protected by a heavy substantial base, making it entirely dust and water proof. The controller may be mounted on the base, or it may be located apart and at any distance from the winch. The winch as shown in the accompanying illustration, is engaged in drawing a car from the tracks of the B. & O railroad into the shipping room of the Link Belt Engineering Co. at Nicetown, Philadelphia. By the use of this winch, the use of a locomotive for bringing the cars into and out of the shop is entirely obviated. The cars can be moved when needed, without any delay in waiting for a locomotive. The slow method of moving cars in the absence of a locomotive by having laborers move them with pinch-bars is also dispensed with.

A NEW TYPE OF METAL SAWING MACHINE.

The Railway Appliances Co., Chicago, Ill., has recently brought out a new design of metal sawing machine for cutting off gates from steel castings. Three of these machines have recently been furnished to the American Steel Foundries and are reported to be rendering very good service.

A brief description of the machine is as follows: They are designed somewhat on the same principle as the arbor driven saw, built by the same company. They are provided, however, with special arrangements for steel foundry

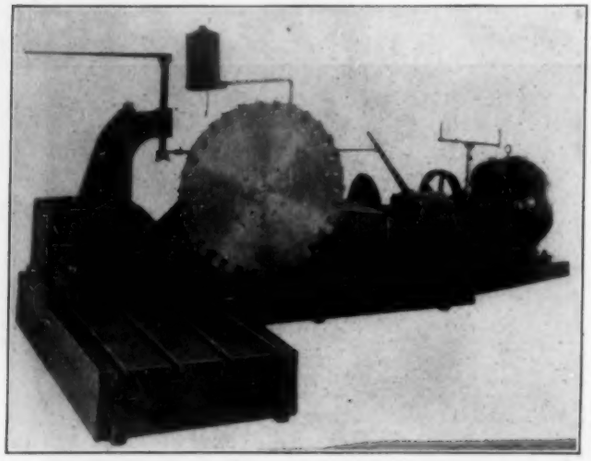


FIG. 1.—FRONT VIEW OF METAL SAWING MACHINE.

work, and with the intention of providing a machine that will permit the use of any modern cold saw, with inserted high-speed steel cutters, up to its maximum limit. In order to accomplish these results, the machines have been made much heavier in their proportions than is usual, and steel castings have been substituted for gray iron castings used in earlier machines.

The machines, as shown in the illustrations, are fitted with Taylor-Newbolt blade, 33 in. in diameter, and will cut off risers up to 11 in. in diameter. The saw blade has a travel of 16 in. and with the main driving shaft running at a speed of 200 revolutions per minute the saw blade has a

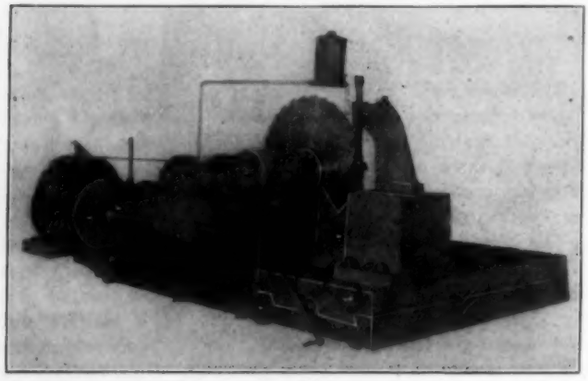


FIG. 2.—REAR VIEW OF METAL SAWING MACHINE.

peripheral speed of 55 ft. per minute, and a variable feed of from ¼ to 1 in. per minute. With a variable speed the peripheral speed and feed are proportionately increased.

The front table with which the machine is furnished has a lateral movement sufficient to enable a proper adjustment after castings have been clamped. The "V" block and clamping arrangement is a feature that permits of the quickest possible arrangements for securing castings, and is extremely desirable. The machine runs very quietly and without any vibration. One of the machines, recently furnished, on which the blade runs at a peripheral speed of 70 ft. per minute is giving excellent service, cutting off risers from steel castings with ⅞ in. feed per minute.

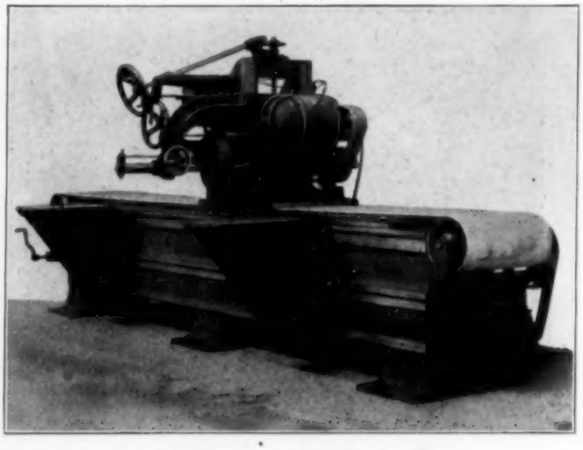
A LARGE TRAVERSE GRINDER.

The Cincinnati Shaper Co., Cincinnati, O., has placed on the market recently the traverse grinder shown in the accompanying illustration. This machine has been designed especially for grinding manganese cast steel centers of railroad frogs and crossings, locomotive cross-head guides, finishing butt ends of connecting rods, etc., and is also adaptable for grinding the ways between the V's on lathe beds, and for other grinding purposes.

The bed, cast in box form and liberally braced internally by means of cross girts, is made in varying lengths, the illustration showing one 15 ft. long, which permits a longitudinal travel of the saddle, carrying the wheel, etc., of 12 ft.

The saddle is traversed by a 2 h. p. motor through a rack and pinion at a speed of 15 ft. per minute, and is automatically reversed at each end of the stroke, which may be of any length up to the limit of the machine.

The grinding wheel, driven by a 5 h. p. motor at a speed



"CINCINNATI" TRAVERSE GRINDER.

of 1,500 r. p. m., has a horizontal movement in the direction of its axis of 15 in., and a vertical movement of 11½ in.; these movements being operated, one by the hand wheel attached to the bracket supporting the grinding wheel shaft, and the other by the large hand wheel whose shaft is set at an angle. The third hand wheel is for moving the saddle by hand when desired. The motor is adjustable on the saddle for the purpose of tightening the belt driving the grinding wheel shaft.

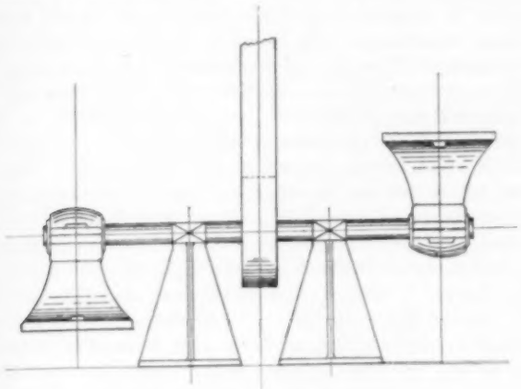
The tables are horizontally adjustable along the bed by means of a rack and removable ratchet wrench, and vertically by means of a screw, operated by the socket wrenches attached to them. A pump and system of piping is provided for supplying water to the grinding wheel, and canvas curtains also, for protecting the sliding ways on the top of the bed from grit.

All controls are located in the saddle; a lever, not visible in the illustration, being provided for reversing the saddle by hand when desired.

There is being built at Syracuse University, Syracuse, N. Y., as an adjunct to the College of Applied Science, an engineering laboratory, which when completed, will be one of the largest possessed by any technical school in the country.

SCHEME FOR CLEANING LARGE HOLLOW CASTINGS.

The working parts of the Case engine are enclosed in a hollow frame in which the principal bearings run in oil. In setting up new engines a cleaning of the inside of the casting by the ordinary method of removing core sand is not sufficient. Scale and grit is apt to work loose in course of time and injure the bearing surfaces. To obviate this difficulty and ensure a perfectly clean interior, Robert H. Brown, secretary and general manager of the New Britain Machine



DEVICE FOR CLEANING CASTINGS.

Co., has devised a scheme which might be applied with equal success to large castings of other forms. The principle involved is simply that of the tumbler, each engine frame being so attached to a shaft that it serves as its own barrel.

The manner of carrying out the operation is shown in the accompanying sketch. Two of the frames are mounted upon a shaft bearing a pulley for a belt from a convenient source of power, the two castings being attached in a balanced position. A flange and nut at the end of the projecting shaft serves to keep the frames in position. A quantity of "star" jack-stones are then introduced, the openings closed and the whole revolved until the surface is perfectly clean and bright.

A New Process of Galvanization.

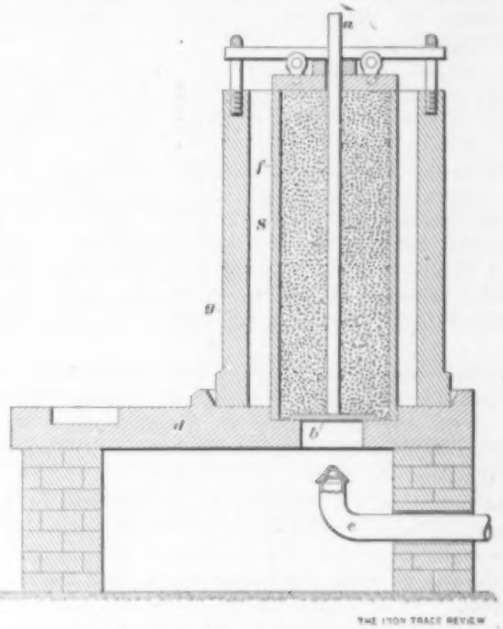
Consul General Guenther, of Frankfort, reports that Mr. Cowper Coles, an Englishman, has invented a new process of galvanization, and has recently demonstrated the same with samples of iron, copper, aluminum, and other metals. The objects to be galvanized are simply heated to 260° in a bath of zinc vapor, the duration of which depends upon the desired thickness of the coating, but which is always short. After heating the objects are thoroughly coated with a layer of zinc, which on the surface has formed an alloy with the other metal by penetrating into it to a considerable depth. A copper rod can in this way be almost entirely transformed into brass, while the temperature employed remains far below the melting point of both metals. A great advantage of the process lies in the evenness of the coating, which is so perfect that such zinc-galvanized screws and bolts afterwards fit perfectly into the nuts, while with other methods they have to be polished. It is also very convenient that the objects to be galvanized have not first to be cleaned.

The retorts in which the heating takes place are of iron, and are heated from the outside. Another peculiar advantage is that the zinc does not adhere to the walls of the retort, but that these, after months of use, are entirely clean. The explanation for this is that the walls of the retort are heated most, so that no zinc vapor condenses on them. Experiments to use the process with metals other than zinc have been so far made with copper and antimony, and have been partly successful, but not to a degree to make them of practical use.

CORE FOR USE IN CASTING HOLLOW CYLINDERS IN BLOCK-MOLDS.

Hugo Brauns, of Germany, has patented in the United States an improved core for use in casting hollow cast iron or steel cylinders in block-molds. The invention relates to a core, by the aid of which hollow cylinders of steel or cast iron may be cast in block-molds of cast iron without rupture of the cylinder in cooling, even when the latter is of comparatively great length. The core consists of a hollow cylinder, the wall of which is weak enough to yield when the casting contracts.

In the accompanying illustration, which is a vertical section from a mold having a core made according to this invention, the core cylinder F is made by stamping from a mixture of refractory materials. It is strengthened to withstand the strain of casting by a filling S, which may be a material such as dry sand, which may be readily removed after the cast metal has solidified. The removal of this sand or other filling material may be effected by a blow on the rod A, which passes through the filling material. This will break the bottom plate B and allow the filling material to flow through the hole in the plate D. When the cylinder has been emptied in this manner it can yield as the casting contracts. Air may be blown through a pipe E to pass through the cylinder F when this is emptied, and assist in cooling the interior. In this manner the disadvantage of



CORE FOR CASTING HOLLOW CYLINDERS.

casting hollow cylinders in block-molds is eliminated, that is, the exterior of a cast cylinder in contact with the block mold G cools more rapidly than the interior in contact with the cast cylinder F. Rupture of the cast cylinder is thus avoided. A blast of air is only necessary when the wall of the cylinder is of considerable thickness, as in the case of the most common size of cylinder the natural air draft suffices.

Commerce Through the Soo.—The report of lake commerce through canals at Sault Ste. Marie for the month of August as compiled by the engineers' corps, U. S. A., gives the total freight passing through the United States and Canadian canal as 6,327,595 net tons. Three thousand and eighty-eight vessels passed through having a registered tonnage of 5,038,651.

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Acme Tool & Mfg. Co., Braddock, Pa., has been incorporated with $10,000 capital stock.

The Beaver Metallurgical Co., of Beaver Falls, has been granted a Pennsylvania charter.

The Wm. B. Anderson Foundry Co., of Chicago, has been incorporated with a capital of $5,000 to engage in the manufacture of brass castings.

The Central Foundry Co., of Milwaukee, Wis., has been incorporated with a capital of $10,000, the incorporators being Daniel Walsh, S. Edward Smith and Alex. E. Martin.

O. R. Whitney, 39-41 Cortlandt street, New York city, is inquiring for three 60 h. p. locomotive boilers and 2,000 ft. cast steel 1-in. cable. A quick delivery is desired.

The Proctor Foundry & Machine Co., Gadsen, Ala., has been incorporated to continue operating the plant of the Gadsen Car & Machine Co. The daily capacity will be about 25 mining cars. Robert Proctor is the engineer in charge.

The Miners' Foundry & Supply Co., of Carterville, Mo., has been incorporated with a capital stock of $50,000. The incorporators are H. C. Cole, Charles P. Wallace, O. H. Schoenhess and others.

The Federal Furnace Co., Chicago, has been incorporated with $600,000 capital stock to operate blast furnaces. The incorporators are Robert W. Campbell, William Beyer and Mark Breeden Jr.

The Dayton Vulcan Foundry Co., Dayton, O., has been incorporated with a capital stock of $10,000 by Hugo Cook, M. W. Chambers, William F. Miller, W. W. Bishop and H. F. Nolan.

The Special Machinery Corporation, incorporated in New York with a capital of $60,000, will manufacture machinery. The incorporators are Herbert V. Folk, Alfred E. Lloyd, 58 Pine street, and G. E. Shaw, 25 Broad street, New York.

The Trexler & Terrell Coal & Iron Co., Olympia, Wash., has been incorporated with $100,000 capital stock. The incorporators are: Henry W. Lung, John L. Case and Beatrice Lung.

The Harrisburg Hardware Co. has been incorporated in the state of Pennsylvania with a capital of $50,000. The members of the firm are William H. Cleckner, Harry A. Dill, John W. Weibley and John H. Bricker, all of Harrisburg. The company will conduct a large store.

The Susquehanna Contracting Co. is the name of a new company to have an office at Harrisburg, Pa. The company has a capital of $25,000, and is composed of John D. Landis and Clarence H. Miller, Mechanicsburg, Pa., and David Gring, Newport.

The Severance-Broughton Co., of Walla Walla, Wash,, has been incorporated to engage in the machine shop and foundry business. The incorporators are: A. W. Severance, M. H. Broughton and John H. McDonald. The capital stock is $25,000.

The Richmond Forging Co., Richmond, Va., has been incorporated with $100,000 capital stock. The stockholders are Poseph Bryan, H. A. Gillis, Jonathan Bryan, O. P. Redford and O. J. Sands. W. R. Williams will be vice president of the company and Jonathan Bryan, president.

Guadalajara, Mexico, requires 3,000 tons of steel rails for its electric street railway lines. An order for 65 miles of trolley wire will probably also be placed in this country. The cars for the lines will probably be built at the new works at Peralvillo, near Mexico City.

The Motor Car Co., Baltimore, Md., has been incorporated with a capital stock of $15,000 for the purpose of dealing in automobiles. The incorporators are Arthur Stanley Zell, 210 Rodgewood road; Roland Park, Martin G. Gill, Oliver C. Zell, and Randolph Barton Jr.

Julian Kennedy, of Pittsburg, buying machinery and supplies for the erection of the new blast furnace at Chicago to be built by Pickands, Brown & Co., will soon be in the market. Supplies for the new stack at Mayville, Wis., for the Northwestern Iron Co.'s plant will also be purchased by Mr. Kennedy.

The M. H. Brigham Co., 63 Haverhill street, Boston, Mass., has been incorporated with a capital stock of $10,000. The new company will engage in the engineering and machinery business, will manufacture gasoline engines and deal in new and second-hand machinery. Charles C. Stanchfield is the president and M. H. Brigham the treasurer.

The Renault Freres Agency, recently incorporated with a capital of $15,000 to manufacture motors, engines, boats, vehicles, etc., has the following list of directors: Clarence A. Tileston, 142 West Eighty-second street; Maurice G. Bernin, 322 Fifth avenue; Herbert B. Miller, 319 West Ninety-fifth street; Robert E. Prince, 37 Liberty street, New York.

The Sheet Metal Specialty Co., Goshen, Ind., whose incorporation was mentioned in our last issue, has leased a new building 72 x 22 ft. and will do a general sheet metal business. The company is in the market for galvanized sheets, cornice supplies, tin plate, solder and warm air furnaces. Catalogues from various sellers are requested.

The John Wilfert Co., Brooklyn, N. Y., has been incorporated to manufacture and deal in manufacturers' and mill supplies, pipes, valves, machinery, etc. The capital stock is $15,000, and the incorporators are: Frederick G. Beilstein and William G. Hawes, both of 490 Bushwick avenue, Brooklyn; Christian Beilstein, 87 Fulton street; John C. Loud, 87 Nassau street, both of New York.

The Moeschl-Edwards Corrugating Co., Cincinnati, O., has been incorporated with a capital stock of $50,000, to manufacture and deal in iron, steel and other metals., C. B. Edwards, of Dayton, Ky.; Frank A. Moeschl, of Newport, Ky., and Albert Silva, also of Newport, are the incorporators. The company elected officers Sept. 11 at the office of the Kentucky Iron Roof & Corrugating Co., Prospect avenue and Twelfth street.

Fires:—

A $60,000 fire destroyed many valuable patterns and ruined the machinery in the foundry of the Hansell-Elcock Co., of Chicago. Insurance to the amount of $30,000 had been placed on the building.

New Construction:—

The Bagley & Sewall Co., of Watertown, N. Y., is building an addition to its foundry, 30 x 140 ft.

The E. R. Allen Foundry, of Corning, N. Y., is being enlarged by the construction of a 26 x 60 ft. frame addition.

Chas. Palm, of Sacramento, Cal., is constructing a new foundry 130 x 150 ft.

The Crossley Mfg. Co. has taken out a building permit for the construction of a two-story brick pattern shop at East Trenton avenue and Monmouth street, Trenton, N. J.

Geo. B. MacDonald, proprietor of the Longview Iron Works, of Longview, Texas, is planning to build an addition to his foundry, 50 x 100 ft.

The Rockford Mfg. Co., of Rockford, Ill., is planning to double the capacity of its foundry by constructing additions this fall.

The Bullock Mfg. Co., Cincinnati, O., has awarded the contract for an addition, 105 x 250 ft., two stories high, to

be used as a machine shop for the making of new special lines.

H. H. Smith, of Lodi, has purchased property in Passaic, N. J., and intends to erect an iron foundry which will employ about 100 men.

The Connellsville Machine & Car Co., of Connellsville, Pa., whose plant was destroyed by fire some time ago, states that it expects to rebuild in the near future.

The Lane Tool Co., Cleveland, is about to build an addition for machine shop purposes. Further information may be expected in the near future.

William Steele & Sons, Philadelphia, will build a two-story foundry 150 x 36 ft. and a one-story foundry 150 x 46 ft. at a cost of $35,000.

The Miller Lock Co., Philadelphia, has awarded the contract for a two-story foundry 47 x 50 ft., to cost about $6,600. George H. Thirsk is the builder.

Cooke Bros., of Traverse City, Mich., are constructing buildings for a new iron and brass foundry in that city. One of the buildings is 30 x 150 ft. and is to be used as a foundry, and the other is 30 x 50 ft., to be used as a machine shop.

The Standard Welding Co., Cleveland, is building a new factory 60 x 160 ft., to cost $100,000. The new machinery, most of which has been purchased, will increase the electric welding capacity of the plant very materially.

Bartlett, Hayward & Co., iron founders of Baltimore, Md., whose plant is at Scott and McHenry streets, have acquired additional territory adjoining their property and will enlarge their plant.

The Cincinnati Iron Fence Co., Cincinnati, has just purchased property on which it will erect a new foundry, 110 x 200 ft. Considerable new equipment will be purchased and the work will be undertaken at once.

The J. Stevens Arms & Tool Co., Chicopee Falls, Mass., is adding a two-story addition to the No. 2 mill at its power plant. This will mean an increase of 25,000 sq. ft. of floor space.

The Des Moines Mfg. & Supply Co., Des Moines, Iowa, has about completed its new foundry building which is 44 x 160 ft. The new structure will be equipped for light castings and special machinery.

The contracting firm of Kimmell & Hartzell, of Bellevue, O., has secured the contract for the carpenter work for the new foundry building of the Ohio Cultivator Co., to be erected in that city. The main building will be 76 x 250 ft., with an annex 30 x 40 ft.

The Fort Pitt Malleable & Gray Iron Co., McKees Rocks, Pittsburg, recently completed the erection of a new pattern shop and pattern storage house. It is also building a 50 x 150 ft. core room, the new additions enabling the company to increase its capacity to 10,000 tons of malleable castings annually.

The Deming Pump Co., of Salem, O., will erect a large storage building for taking care of the core boxes, iron flasks, etc., used in the foundry. Thus far one division of the foundry building has been used for this purpose, but the large amount of work on hand makes it necessary to use every available portion of the foundry for the work for which it was intended.

The Hercules Gas Engine Works, San Francisco, Cal., are now constructing a new machine shop to replace the one destroyed by fire. It will be 70 ft. wide by 200 ft. long, and will be equipped with a traveling crane and the very best of machine-shop equipment. The company has not yet placed its orders and is in the market for lathes, planers, shapers, turret lathes, boring mills, radial drills, and small tools, all of the original equipment having been lost. It is expected that the buildings will be ready for the installation of machinery not later than Nov. 1.

Building for August shows a gain of nearly 50 percent over the same month a year ago. Over $50,000,000 is the aggregate of the cost of buildings specified in permits issued during the last month for 11,540 structures. This increase has been a continuous process through the preceding months and the iron and steel industries have been a potent factor in bringing about the splendid record. New construction in the Pittsburg district has been especially brisk and noteworthy, reflecting the unusually prosperous condition of those industries in that section. The growth of the employment of steel in buildings has made this building record an important movement to iron and steel interests.

General Industrial Notes:—

The Eastern Steel Co. is installing an engine with cylinders 72 in. in diameter at its new plate mill at Pottsville.

The Allard Iron Works, Sandy Hill, N. Y., whose plant was totally destroyed by fire recently, has given up building again.

The United Coke & Gas Co., Camden, N. J., has just completed 100 new coke ovens and now has a capacity of 150 ovens in operation.

The Susquehanna Iron & Steel Co. has sold the largest cinder dump in Lancaster county to H. S. Kerbaugh, Inc., railroad contractors. It is located near Columbia, Pa.

The Fairbanks Machine Co., Springfield, O., will use the vacated shops of the Detroit, Toledo & Ironton railroad, the facilities of which plant the company will increase and enlarge.

The Eleanor Iron Co., Tyrone, Pa., expects to resume operations in every department on or about Oct. 1, and will manufacture high grade merchant bar iron. Correspondence for prices, etc., is invited.

The Columbus Structural Steel Co., Columbus, O., in preparation for the starting of its plant, has authorized the purchase of $25,000 worth of steel. It is not expected that the company will be turning out finished material until the first of the year.

The International Machine & Screw Co., Springfield, Mass., which was incorporated in December, 1904, has progressed with its organization to a point where it is looking for a site to build. T. W. Leete is president and treasurer of the company, and G. T. Warwick vice president and general manager.

The United States Sheet & Tin Plate Co. at a meeting of its executive committee at Cincinnati perfected plans which will materially change the operation of several of its mills, including those at Marietta, Newark and Newcomerstown, O., as well as one being built at Byesville, O. The plant at Newark is to be abandoned and dismantled and the machinery is to be moved to the Newcomerstown mills.

Trade Notes:—

The General Castings Co., formerly of Pittsburg, has moved its offices to the works at Verona, Pa.

The Cincinnati Machine Tool Co. has shipped three of its large 32-in. table drills to Panama to be used in the canal construction work.

The American Bridge Co. has received a contract from the American Steel & Wire Co. for ten steel barges to be used on the river between the Rankin and Braddock works.

The Bosworth-Holding Co. has reorganized under the name of Bosworth, Dilley & Holding, with offices at 721-723 Rockefeller building, Cleveland.

The Torrington Mfg. Co., Torrington, Conn., will specialize in the future and manufacture nothing but machinery, having sold its department of brass novelties to the Turner & Seymour Co., of the same place.

The Keeler Co., of Williamsport, Pa., has received a contract for a 175-h. p. boiler and a 125-h. p. Corliss engine from the Innes-Demarest Stove & Heater Co., of Binghampton, N. Y. The new plant of the purchasing company is expected to be in operation by Jan. 1.

The Seidel & Hastings Co., of Wilmington, Del., is in receipt of an order from the Maryland Steel Co. for a quantity of its charcoal iron ship plates to be used at the Panama canal.

A special meeting of the board of directors of the Consolidated Rail & Steel Co., St. Louis, was held at the office of that company Aug. 31, to recommend the calling of a meeting of the stockholders. At this meeting it is intended to consider an increase in capital from $12,000 to $45,000 in 450 shares at $100 each.

A. J. Fisher, 50-56 South Clinton street, Chicago, manufacturer of the Fisher Air Compressor, has shipped one 500-cu. ft. compressor to the Decatur Car Wheel Mfg. Co., Birmingham, Ala., to be attached tandem to the Corliss engine in operation at this company's plant. One 75-cu. ft. compressor, direct connected to gasoline engine, has also been shipped to New South Wales, Australia, for portable work in the government ship yards at Sydney.

The Krips-Mason Co., Philadelphia, is distributing at the Portland exposition souvenirs consisting of note books and tape lines. The tape lines are enclosed in a neat celluloid case, bearing a picture of the Krips-Mason punching machine.

The Rose Brick Co. will have its new plant in Oakland, Cal., completed in about four weeks. The output of the plant will consist entirely of magnesite fire brick, for use in blast furnaces, smelters and other places where an intense heat must be withstood. The management states that the entire output, including the carbonic acid gas, which is driven off in the process of making, has been contracted for at least a year ahead. The plant is situated near the head waters of a navigable estuary of San Francisco bay, and the shipments, which will be mostly to the East, will all be made by water, and in this way the freight rates are reduced to the minimum figure, as the brick makes excellent ballast. This cheapness of freight rates, together with the close proximity of the plant to the fields where the raw material is obtained, puts the price situation practically in the hands of the Rose Brick Co. The output of the plant will be for the present 16,000 brick, weighing 75 tons, daily.

Trade Publications.

The Three Rivers Tool Co., Three Rivers, Mich., has issued a price list of Mathews hand reamers, machine reamers and shell reamers.

The Philadelphia Expansion Bolt Works, Philadelphia, Pa., has issued catalogue No. 25, describing expansion bolts. A large number of different types of expansion bolts suitable for every conceivable use are illustrated and described.

The Garvin Machine Co., New York city, is distributing a folder illustrating the Garvin direct constant feed milling machine. This is a new design of milling machine and is made in both the plain and universal type.

The Carpenter Steel Co., Reading Pa., has issued a catalogue showing the various classes of steel and forgings made by it. These include tool steels, both air and water hardened, file steel, and machinery and spring steel. Steel wire and forgings are also manufactured. The book contains a number of tables and useful data. The book contains 60 pages and is 3½ x 6¼ inches.

The Rosedale Foundry & Machine Co., Allegheny, Pa., is distributing catalogues describing the Playford Chaingrate Stoker. The Rosedale Foundry & Machine Co. purchased, in 1903, the patents and business of the Playford Stoker Co., of Cleveland, and the catalogue describes the stoker as manufactured by it, and also illustrates various applications of the machine to different types of boilers. Photographs of various installations are shown.

The Robins Conveying Belt Co., Park Row building, New York, has issued Bulletin No. 12, describing various installations of the Robins hoisting and conveying machinery for power stations. This bulletin comprises a description of the Robins belt conveyor, and gives diagramatic illustrations of the coal and ash handling machinery in the Interborough Rapid Transit Co., New York power station, and in the plant of the Richmond Heat, Light & Power Co., Staten Island, N. Y., and in the power house of the Brooklyn Heights Railroad Co., Brooklyn, N. Y. The system used in the Kingsbridge power plant of the Metropolitan Street Railway Co., New York. It also illustrates various portions of other installations.

The Link Belt Machinery Co., Chicago, Ill., has recently issued two booklets, entitled respectively, "Link Belt Car-Hauls" and "Washing Bituminous Coal." The first booklet describes various forms of car hauls, and discusses the advantages of using a car haul, over the practice of handling cars in trains at mines or power houses. A number of photographs of various installations are shown. The second booklet describes the process of washing coal as carried on at various washeries. The various pieces of apparatus used are illustrated and described, and a number of jigs, including the Huling, New Century and Stewart are described in detail. A few pages follow on sampling and analyzing coal, and photographs and drawings of machinery and completed installations fill the closing pages of the book.

The Dodge Mfg. Co., Mishawka, Ind., has just issued their 1905 C-7 catalogue. This catalogue is of standard size, 6 x 9 in., and is a handsome publication. It is bound in cloth, contains 416 pages, and has been built for the purpose of furnishing to all those interested in power transmission equipment, the most up-to-date and reliable data that can be compiled. In fact, it may be said to be a veritable text book on the subject of power transmission. It is well illustrated with half tones, showing various installations that the Dodge Mfg. Co. has made, and is replete with a large number of extremely valuable tables of interest to engineers. The catalogue is thoroughly cross indexed and is a valuable addition to the library of any engineer or manufacturing company.

The R. K. LeBlond Machine Tool Co., Cincinnati, has issued two catalogues describing respectively lathes and milling machines. The catalogue descriptive of lathes is an attractive publication of 35 pages, and describes engine lathes of sizes from 12 in. to 36 in. A few pages in the front of the book are devoted to descriptions of the various mechanisms of the machine, including the change-gear arrangements for screw cutting and of apron and cross feeds. The catalogue devoted to milling machines is a more comprehensive book, consisting of nearly 100 pages. It describes a large number of milling machines of all classes from a small plain milling machine to the largest and heaviest type of universal milling machine. A couple of special milling machines are also discussed, and a large portion of the book is given to the descriptions of various accessories for milling machine work.

A Machine Tool Pocket List.—The Angus Ballard Co., 42 Broadway, New York, has recently brought out a Machine Tool Pocket List. This list shows the manufactures, together with their addresses, of all the various types of machine tools. Various tools are well classified, and the general subdivision of tools which are parts of a general class is well carried out. Where a tool is known in the trade under a name which is different from the name of its manufacturer, and to which the maker's name gives no clue to the trade, or visa versa, this trade name follows the maker's address, in quoted italics. A feature which adds much usefulness to the list is the information as to sizes of tools made by various concerns on such classes as differ widely in size as made by the several manufacturers. The book is a most valuable directory for anyone who is required at any time to purchase machine tools.